DISEASES OF WOMEN

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A PRACTICAL TEXTBOOK

OF THE

DISEASES OF WOMEN

BY

ARTHUR H. N. LEWERS, M.D. LOND., I

SENIOR OBSTETRIC PHYSICIAN TO THE LONDON HOSP
EXAMINER IN MIDWIFERY AND DISEASES OF WOMEN AT THE C
THE ROYAL COLLEGE OF PHYSICIANS OF LONDON AND OF THE
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LATE EXAMINER IN OBSTETRIC MEDICINE AT THE UNIVERSITY OF LONDON;
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1912

PREFACE

TO THE SEVENTH EDITION.

THE present edition has been considerably enlarged, but, as the Publisher now adopts a slightly larger size for the books in his Practical Series, of which this forms one, the actual number of pages is not much greater than in the last edition.

The section on Cancer of the Uterus—in which is included a full description of Wertheim's hysterectomy, which the author had the advantage of seeing Wertheim perform on three cases in Vienna—and that on Fibroid Tumours, have been amplified; much new matter has been added in various parts of the book, and the whole has been thoroughly revised.

The author has aimed at retaining the clinical and practical characters of the book, which, according to information reaching him from various quarters, have been found useful in the previous editions.

A large number of additional illustrations appear in the present edition, and several micro-photographs. The author has to thank Dr. R. D. Maxwell, lately Obstetric Registrar at the London Hospital, for arranging for the production

of the micro-photographs of the sections selected for illustration; and the descriptions under the micro-photographs of the appearances presented are by him.

The views expressed and the methods advocated by the author are, at all events, based on an experience of twenty-seven years on the staff of the London Hospital, where the opportunities of acquiring clinical experience are exceptionally large.

June, 1912.

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APPENDIX B.

INTRODUCTION.

It may be safely said that no subject presents greater difficulties to the beginner than Gynæcology.

The opportunities of becoming practically acquainted with it are necessarily less than in most other branches of medicine. Take, for example, diseases of the heart: a beginner, if he listens to the heart in as many cases as possible, spends some three or four weeks before he becomes able to appreciate even well-marked murmurs.

Frequent examination of cases is just as necessary, in order to acquire accuracy in physical signs, in gynæcology, as in diseases of the heart; but whereas an almost unlimited number of observers can listen in a case of chronic heart disease, a gynæcological case can only be examined by two, or at most three, on any one occasion.

It is therefore proportionately important that the very most be made of each clinical opportunity.

Before taking a clinical clerkship in the department for the diseases peculiar to women, the student should refresh his knowledge of the relations of the pelvic organs by attendance in the post-mortem room, and by examining for himself the position of parts when the abdomen has been opened, and the intestines are held up out of the way.

Particular attention should be paid *to the uterus*, noticing

its size, relation to the bladder, and testing its mobility by seeing how far it can be drawn up out of the pelvis; *to the broad ligaments*, and the relations of the structures projecting from them; and *to the pouch of Douglas*, bounded laterally by the utero-sacral ligaments, and at its lowest part in close relation with the posterior vaginal wall.

The pelvic organs should then be taken out *en masse*, and examined more closely.

First the urethra and bladder should be laid open, the length of the urethra should be noticed, and the position of the orifices of the ureters. Probes should be passed along them. Next the vaginal portion of the cervix should be looked at, and a probe passed into the uterus. Finally the uterus should be slit up, noticing the relation of the bladder to the anterior aspect of the cervix—the cavity of the cervix marked by the folds of mucous membrane constituting the *arbor vitæ*—and observing the cavity of the body of the uterus. Fine bristles should be passed from the uterus along the Fallopian tubes.

The various named structures shown in Fig. 190, on page 344, should be identified.

If even one set of organs be examined in this way, the student will find it in the end a great saving of time, as his clinical progress will be more rapid and intelligent than it otherwise could be.

Another point of importance is by no means to neglect examining cases where the physician pronounces everything normal; and again, to take every opportunity of recognising physical signs when a case is being examined under an anæsthetic. Those commencing the study of gynæcology should more especially concentrate their attention on acquiring

proficiency in the Bimanual examination, and in the diagnosis of pregnancy, especially in the earlier months.

I have endeavoured to arrange the divisions of the subject, as far as possible, in what may perhaps be called their natural order from a clinical point of view, first dealing with the history, then with the physical examination, then with diseases of the external parts, diseases of the vagina, diseases of the uterus, and so on.

Numerous illustrative cases have been inserted at various parts of the book; they are, I think, a considerable help in learning the subject, and, moreover, they relieve the monotony incidental to systematic description.

A PRACTICAL TEXTBOOK

OF THE

DISEASES OF WOMEN.

CHAPTER I.

On the Mode of Investigating a Case.

Before discussing systematically the more important of the diseases peculiar to women, it is desirable to consider shortly the proper way of investigating a case in this special department of practice.

By the expression "proper way" is meant the mode of procedure adopted by a practical physician in endeavouring to arrive at a diagnosis in any case that comes before him.

The materials available for diagnosis fall naturally under two heads :—

First.—We have all the patient can tell us about herself—**the History.**

Second.—The physical signs we can observe for ourselves—**the Present State.**

The History.

The following should be noted :—

Patient's name, address, age, occupation.

Whether *married* or *single.*

If married, *how long married.*

Number of children, if any, with *date when last was born.*

Whether she has had any miscarriages; if any, date of each, and the period to which pregnancy had advanced when the miscarriage occurred.

Character of each confinement, easy or instrumental; if flooding, severe abdominal pain, vomiting, or fever (shivering fits, thirst, &c.), occurred after the confinement. A rough guess may be formed as to the nature of the confinement by asking how long she was compelled to remain in bed after it.

We now ask the patient:—

What do you complain of?

Her answer should be taken down as far as possible in her own words, leading questions being avoided, and after each answer merely enquiring "anything else?"

The *duration* of each symptom should be noted.

Some difficulty at times arises in fixing the date when the present illness began. Here we can often succeed by asking:—

How long is it since you think you were quite well?

We next enquire how menstruation has been performed since the beginning of the illness.

We ask:—

Are you quite regular now?

If the patient says "Yes," we next say:—

Every four weeks?

Because women often say they are "quite regular" when they mean they menstruate every fortnight or three weeks; in fact, by "regular" they mean they do not go *more than four weeks* without menstruating.

How many days does it last?

Have you any pain with it?

Enquiry is to be made whether the pain is before the flow begins, or during the flow, or after it.

If, as often happens, the pain is not sharply limited to one or other of these periods, we should find out when it is at its worst.

Also ascertain the seat of the pain, *e.g.*, the back, hypogastrium, or one or other ovarian region.

The following questions should also be asked:—

Is the pain constant, or worse at times?

Does the pain shoot down the legs?

Is it relieved by lying down?

Particularly enquire whether the patient has always had

the pain since she first began to menstruate, or whether it has only affected her for a limited time, *e.g.*, since the birth of the last child, or since she married.

Is the discharge a good colour? i.e., red.

Do you lose much? Two women may menstruate for the same number of days each period, but one may lose much more than the other each day.

Are there any clots or shreds in the discharge?

Having learned how menstruation has been performed since the beginning of the illness, we now go on to ascertain how the function was performed previously, to see if there has been any alteration.

We ask:—

When were you first poorly in your lifetime?

Supposing the patient to say she was fifteen at the time, we ask "between fourteen and fifteen?" or "fifteen and sixteen?"

Did you come on quite regular at first, or after seeing it once did it leave you for some months?

Either alternative is equally physiological.

We then ask as before, whether she was quite regular every four weeks when the function had become established, or how it was. The duration, quantity lost, colour, clots or shreds in it, if attended by pain or not, are noted as in the former case.

Many diseases disturb the regular performance of the menstrual function, and the object of these enquiries is to be able to compare the performance of the function since the patient has been ill, with its performance when the patient was in thoroughly good health.

There is no absolute standard applicable to all women. Individual variations within the limits of health are very common; but the way the function was performed when the patient was quite well is the standard with which to compare the way it has been performed since she has been ill.

Short enquiries are made as to:—

I. *Micturition.*

(*a*) Have you any trouble with your water?

(*b*) Are you obliged to pass it too frequently? and if so, how many times have you to get up at night to pass it?

(*c*) Have you any pain in passing it?

Common instances of micturition being affected by neighbouring local disease are :—

(i) *Retroversion of the gravid uterus*, causing retention and subsequent dribbling over of the urine.

(ii) *Pelvic peritonitis*, which is very often a cause of *frequent desire* to pass water.

II. *The digestive system.*

(*a*) Is the appetite good?

(*b*) Are the bowels regular every day, or confined?

(*c*) Have you pain when you pass your motions?

III. *Nutrition.*

Have you got thinner lately?

IV. *Any other system, e.g.*, the nervous system, if the patient's account of her illness suggests the desirability of doing so.

V. *Previous illnesses.*

This concludes the taking of the History.

The next step is to ourselves observe all we can as to the patient's condition; the result of our observations constituting what is called :—

THE PRESENT STATE.

First the general aspect is to be noted.—Thin or well-nourished. Healthy coloured or pale. Whether looking obviously ill or not. Presence or absence of œdema.

Note also the state of the tongue and pulse; and if there is any indication of fever, take the temperature.

Guided by what we have learned from the history, we may, or may not, at this stage examine the chest.

The further examination is of two kinds:

(i) Examination of the abdomen.

(ii) Vaginal examination.

I. **Examination of the abdomen.**—The methods employed are:—Inspection. Palpation. Percussion. Auscultation.

The patient should lie on her back, all clothes fastening round the waist being loosened; it is best to have the surface of the abdomen exposed.

Inspection.—We notice: The *size of the abdomen*, whether distended or not. The *shape of the abdomen*—localized bulging, *e.g.*, in the flanks. The *condition of the umbilicus*. If the umbilicus is depressed, there is usually no very considerable tumour or accumulation of fluid within the peritoneum. Any apparent enlargement of the abdomen in such a case is simply due to accumulation of fat in the abdominal walls, with or without distention of the intestines by flatus.

The position of the umbilicus—whether exactly in the middle line or displaced to one side, whether nearer the pubes or the xiphisternal articulation. This can of course be more accurately ascertained by measurement.

The presence of pigmentation, particularly between the umbilicus and the pubes.

The presence or absence of "skin-cracks"—lineæ albicantes—in themselves only evidence of over-distention of the abdominal walls; but the commonest cause of the over-distention is pregnancy.

On the other hand, *absence of skin-cracks* is no evidence that the patient has not had a child at term—it merely establishes a probability in that direction; for in exceptional cases, even when the patient has had a child at full term, skin-cracks may be absent.

The presence of enlarged veins under the skin of the abdominal wall.

Alterations during respiration.—Supposing the presence, for example, of the pregnant uterus at an advanced period of gestation, say at the seventh month; if we ask the woman to take a deep breath and to let it all out while we are looking at the abdomen in a good light, during inspiration, we see the upper border of the swelling formed by the pregnant uterus descend, and during expiration we see it ascend. The same phenomenon is seen in cases of ovarian tumour.

In cases where the tumour does not move appreciably on respiration, a good idea of the position of its upper border may often be obtained by looking at the abdomen while

the patient breathes deeply. On expiration the abdominal wall can often be seen to adapt itself to the underlying tumour, thus enabling the observer to recognise its outline more or less distinctly.

The appearance of the breasts.—Although not strictly forming any part of the abdominal examination, still practically it is at this stage of the examination that it is convenient to note their condition.

We observe:—*Their size*, whether plump or flabby.

If the breast looks plump, this may be due either to the presence of fat, or to a real hypertrophy of the gland tissue. In the latter case the breast has a nodular feeling, which is absent when the plumpness is merely due to fat.

Presence or absence of skin-cracks.—*The nipples*, well formed or not, *e.g.*, depressed, either flat, or actually tucked in at the middle.

The primary areola, i.e., that immediately round the nipple, its size, shade of pigmentation, whether studded with little prominences (enlarged follicles), or not. Whether hairs grow on it, or round it.

The secondary areola; this is usually only to be seen in the later months of pregnancy, and for a variable time after labour. A secondary areola may occasionally be seen in brunettes altogether apart from pregnancy; when present, it occupies an area usually a finger's breadth in width (though sometimes it is much wider) around the primary areola. Its appearance is usually described by supposing a white surface to be painted brown, and then further supposing that a shower of water-drops washes away the pigment where the drops fall, exposing the underlying white.

It really consists of numerous white circles about $\frac{1}{16}$ to $\frac{1}{8}$ inch in diameter, separated from one another by brown intervening spaces.

The presence of enlarged veins on the breasts, as seen in pregnancy.

The presence or absence of secretion.—This is observed by squeezing the breast in the whole hand pretty firmly in the direction of the nipple. The fluid squeezed out may be clear, or milky.

In doubtful cases the expression of a little secretion from the breasts, obtained only after much squeezing, is of small value for diagnosis. Much more reliance may be placed on the appearance of the breast. For instance, if in a woman who has had no children it looks plump, and there are veins clearly seen coursing over it, if the primary areola is deeply pigmented and studded with enlarged follicles, and if there is also a secondary areola, and the breast has the nodular feeling previously referred to, there is a strong probability that the woman is pregnant.

At the same time, if fluid can be obtained from both breasts *easily*—with *one* squeeze in each case—the fact is of considerable importance in establishing a probability of pregnancy.

Palpation.—The whole area of the abdominal wall should be carefully palpated, *using both hands.*

Light palpation gives more information than any effort to overcome the resistance of the abdominal muscles by force.

The patient should be told to keep the mouth open; to breathe deeply and rather slowly, and to let the abdominal wall (or rather, as she understands it, "the stomach") be as loose as she can.

Great assistance will be obtained in some cases, where the patient is very nervous, by taking every trouble to reassure her, and to persuade her, that she is not going to be hurt in any way. Distracting her attention by a few questions is another means of attaining the end in view, namely, as little resistance as possible from the abdominal muscles.

Light palpation frightens the patient least, and does not give rise to any discomfort; it should always be employed first. We may employ deep palpation later on, when we have learned all we can by light palpation, and when time has been given for the patient to become a little accustomed to the examination.

The kidneys.—It is good practice to try and feel the kidneys in each case. The right one is more easily felt than the left. To succeed in this the patient must not be too fat, the abdomen must be fairly relaxed, and there must be a fair amount of space between the ribs and the

iliac crest. In trying to feel the lower end of the right kidney, press the fingers of the right hand steadily and firmly backwards and a little upwards in the interval between the iliac crest and the ribs. The fingers of the left hand at the same time being placed under the patient should make pressure forwards towards the fingers of the right hand.

It is best to press the fingers of the right hand steadily, and to make tilting movements forwards with the fingers of the left hand.

In a great many cases, far more than any one who has not tried it would imagine, the lower end, or more, of the right kidney can in this way be recognised.

If it is not felt at first, we may succeed by getting the patient to take a deep breath.

The lower end of the left kidney is not so often to be made out.

Other points to be noted at this stage of the examination are :—

(*a*) *Whether or not the recti have been separated by over-distention of the abdomen.*—If the patient be asked to raise herself into a half-sitting posture, the edges of the recti can be felt with an interval of varying width between them if they have been separated ; at the same time, a pouching out of the tissues between the separated recti can be seen in such cases. Sometimes, on the other hand, the tissues between the separated recti are tucked in by atmospheric pressure as she raises herself.

(*b*) *Whether any part is tender to light or deep palpation.*—A little care is necessary to avoid being misled. If the patient says it hurts her at one particular place, try several others ; and when the attention has been distracted from the part first pressed, press it again ; or press it while taking off her attention by talking to her.

(*c*) *Whether any abnormal swelling can be felt.*—If such is recognised, endeavour to make out if it is hard or soft ; if it is elastic, or even distinctly fluctuating ; if its outline is regular or irregular ; its exact situation ; central or more to one side than the other. Also

The part from which it seems to spring.—For instance, if

it comes from the pelvis, we shall usually * be unable to get the fingers completely under it in that direction, though able to do so in every other; and if it springs from some other part of the abdomen, *e.g.*, from the kidney, we shall be able to separate it from the pelvis. Of course we are now speaking of fairly simple cases; of these, the above holds true. In a woman who has had several children, and in whom the abdominal walls are thin and lax, it is sometimes quite possible to *apparently* separate the pregnant uterus, at say four months, from the pelvis. That is to say, it is sometimes possible to push up the pregnant uterus during the examination of the abdomen to such an extent that the sacral promontory can be felt below it. In complicated cases, *e.g.*, large tumours coexisting with ascites, diagnosis may be difficult or impossible.

(*d*) Sometimes *a crackling feeling* is communicated to the fingers on palpating the abdomen, rather like what is felt when air has got into the subcutaneous connective tissue—surgical emphysema. The sensation referred to is felt in the abdomen in some cases of peritonitis, being due to the friction between the opposed surfaces covered with lymph †; the rubbing together of these being caused by the palpation.

A similar sensation may be due to actual surgical emphysema of the abdominal wall. This is apt to occur in cases of abdominal section performed in the Trendelenberg position, if the abdominal wound is closed before putting the patient down into a horizontal position. When due to this cause, the sign has no grave significance, and it disappears within a few days.

(*e*) *Hardening of a tumour* may be felt while it is being manipulated; the tumour in that case is almost certain to be the pregnant uterus.

(*f*) *Movements* may be felt against the palpating hand, due to movements of the fœtus in utero.

(*g*) Supposing the tumour to be the pregnant uterus at

* Sometimes a small ovarian tumour with a long thin pedicle may be very completely separated from the pelvis when palpating in this way.

† In some cases, however, where this peculiar sensation is experienced there is no peritonitis. I remember it being well marked in a case of ovarian tumour; yet, at the operation soon after, no evidence of peritonitis was found.

term, it is usually very easy to get the hard fœtal head between the fingers of the two hands in the hypogastric region.

There is another sign of great value in the diagnosis of pregnancy. If the fingers make sudden light pressure at various parts of the pregnant uterus—for example, at the fifth month—they displace a layer of fluid, and often come on some hard part of the fœtus, which recedes as it is touched. The sensation so produced, when one has become familiar with it, is almost pathognomonic of pregnancy. It may conveniently be referred to as the "dipping sign."

(*h*) When a hard tumour is present in the abdomen and there is also ascites, if we make sudden pressure inwards with the tips of the fingers on the hard tumour, a peculiar sensation is experienced, due to displacement of the fluid lying between the abdominal wall and the surface of the tumour.

The above are some of the common points to be attended to in palpation.

Percussion.—The whole of the abdominal surface should be percussed. Particular attention should be given to the flanks, and to any area beneath which any mass has been felt.

(*a*) If dulness be found in one flank, the patient should be turned on the opposite side, and after a few seconds the previously dull area should be percussed again. If the dulness first noticed was due to fluid *free in the abdominal cavity*, when the patient is turned on the opposite side it will be replaced by resonance.

(*b*) Dulness over the central region—umbilical and hypogastric regions—shading off laterally into resonance so that the flanks are resonant, points to some tumour centrally situated, such as an ovarian tumour—the pregnant uterus—a large fibroid tumour of the uterus—a distended bladder, and the like.

(*c*) A tumour in the lumbar region, the tumour being *distinct, and either feeling solid or elastic, over which a* distinct line of resonance (colon) is made out, is probably renal: such as hydronephrosis, or malignant disease of the kidney.

Movable tumours of the kidney generally show a natural tendency to settle back to the side to which they belong.

(*d*) Dulness, generally however somewhat relative, is also obtained over the irregular lumps rising out of the pelvis, produced by pelvic peritonitis, or pelvic cellulitis, or a large pelvic hæmatocele.

Auscultation.—The positive information obtained by auscultation is practically limited to two cases.

1. Pregnancy, uterine or extra-uterine.
2. Large fibroid tumours of the uterus.

Sounds heard over the pregnant uterus.

1. *Fœtal heart sounds.*—Aptly compared to the ticking of a watch heard through a pillow. Two sounds correspond to each beat of the fœtal heart; but often, in the earlier months, only the first sound is audible. Every opportunity should be taken of becoming thoroughly familiar with these sounds. When they are heard, we have conclusive evidence of pregnancy; not being able to hear them by no means excludes pregnancy; nor should it even lead us to infer the death of the fœtus, unless we fail to hear the sounds after several observations at different times. The sounds become clearly audible in the last fortnight of the fifth month—from the 18th to the 20th week; practised observers may sometimes detect them a month earlier, but the date named is the time when they usually become appreciable to ordinary observers.

Their frequency is about 140 or 150 to the minute; they have been said to be faster in the female than in the male, but this is unreliable in particular cases.

2. *The uterine souffle.*—This sound is synchronous with the mother's pulse; it is a blowing murmur produced in the enlarged arteries of the uterus. It is not peculiar to pregnancy, but is also occasionally to be heard over large fibroid tumours, and still more rarely over some ovarian tumours. It is distinguished from a mere pressure murmur by the fact that its intensity varies in a sort of rhythmical manner, gradually *attaining a maximum, and then diminishing* so that the sound becomes nearly inaudible.

3. *The funic or umbilical souffle.*—This is produced by pressure on the umbilical cord, when this is accidentally

pressed between the stethoscope and some hard part of the foetus. It is synchronous with the foetal heart, not with the mother's.

It is only to be heard in a small proportion of cases; and is therefore of comparatively little importance.

This concludes the examination of the abdomen.

We next ask the patient to turn on her left side, to push the hips well towards the edge of the couch, and draw up the knees on the abdomen—in fact, bending herself nearly double. It is an advantage to place the patient's left arm and hand behind her. This allows her to lie more on her face and chest than would otherwise be the case.

We can then go on with the special local examination.

II. **The vaginal examination.**—*The first step is the inspection and examination of the external parts.*—To do this

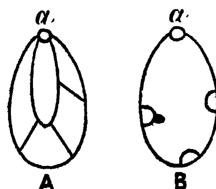


FIG. 1.—To illustrate the difference between a merely torn hymen, A, and the carunculæ myrtiformes, B. In A the hymen has been torn in pieces, which are only separated from one another by linear intervals. In B the carunculæ myrtiformes are seen, which represent the hymen after the damage done to it by the passage of a large body, the size of a fœtal head at or near term, through the orifice of the vagina. They form projections, which are separated from one another by wide intervals. *a*. The orifice of the urethra.

properly, the fingers of each hand are placed at the sides of the vulva, and the labia separated. We should notice:—

1. *The state of the hymen.*—Its shape. Is it perfect (*i.e.*, untorn)? or torn? or is it only represented by the fleshy eminences, about the size of split peas, in the situation where the hymen ought to be? These fleshy eminences—the carunculæ myrtiformes—are what remains of the hymen after the damage done to it by the passage of a child's head at or near term, or of any other body of similar size, *e.g.*, a fibroid polypus, through the orifice. It is important to distinguish between the carunculæ myrtiformes and a merely torn hymen.

The carunculæ myrtiformes are separated from one another by intervals in which no trace of hymen remains, intervals which may be ⅛ inch wide or more (Fig. 1, B).

In the case of a simply torn hymen the fragments are only separated from one another by linear tears, no actual interval of any measurable width existing between the fragments (Fig. 1, A).

The hymen may be torn by coitus, vaginal examination, use of a vaginal douche nozzle, and, it is said, also by merely stretching the legs.

Carunculæ myrtiformes when seen are evidence either that the woman has had a child at or near full term, or that a large body (*e.g.*, a fibroid polypus) the size of a child's head has passed the vulva, or that the orifice has been stretched to a degree that would have allowed a body of that size to pass through it. Hence the importance of being able to identify them, and distinguish them from a simply torn hymen. From the latter condition we learn that the woman has not had a child at or near full term.

It should be remembered that an intact hymen does not exclude the possibility of pregnancy, for in some cases the tissue of which the hymen consists is elastic, so that it stretches instead of tearing; and, besides, pregnancy may occur without penetration. I saw a typical case of this some years ago at the London Hospital, and another, precisely similar sent up to me by Dr. Randall of Forest Gate. The note taken of the former was as follows:—

A young single woman was brought to see me on account of enlargement of the abdomen, and some other symptoms. On examining the abdomen, it was easily ascertained that the patient was six months' pregnant, the fœtal heart being clearly heard. On inspecting the vulva, the hymen was found perfect, and the orifice bounded by it small. My impression was that a digital examination would tear it, and this proved to be the case. Examination with one finger in the usual way, and with no unusual force, caused a deep tear of the hymen posteriorly, which bled freely. A little perchloride of iron and glycerine (1-4) was applied to the laceration, and quickly arrested the bleeding.

Here, then, was a case where a patient had become pregnant though penetration had obviously not occurred.

2. *The colour of the mucous membrane of the vulva should be noted.—It may be redder than normal*, angry-looking, and secreting pus; such is the case in vulvitis, the local affection *par excellence* met with in young children.

The mucous membrane may be pale; this is its normal condition in old women; frequently in these cases there are dark red patches here and there on the general pale surface.

3. *The orifice of the urethra.*—If of normal size, and free from abnormal growths—warty growths—vascular caruncles, and the like. If pus is seen in the orifice, pressure should be made with the finger in the vagina along the course of the urethra downwards, to see if any more pus can be pressed out of the meatus.

4. *The presence of any abnormal swelling or growth, e.g.*, a swelling as large as a walnut or larger in the posterior half of a labium majus, feeling elastic, is often met with, this being a cyst formed from the occlusion of the orifice of the duct of Bartholin's gland on that side, and a gradual dilatation of the duct in consequence till it attains the size and position mentioned.

5. *Swellings or tumours may appear in the vulva and be seen on inspection, that have arisen elsewhere.*—Such may be due to prolapse of the vaginal walls, prolapse of the uterus, tumours of the vagina, and uterine polypi protruding out of the vagina and appearing externally.

6. If nothing is visible beyond the ordinary normal parts, it is well to *ask the patient to bear down or strain.* Then if there is any prolapse, or tendency to prolapse, of the vaginal walls, the anterior, or the posterior, or both, will be seen to descend, and perhaps project some distance from the vulva. Perhaps even the vagina may be completely inverted, and form a lump as big as a cocoa-nut outside the vulva, the surface of the lump showing the external os uteri at one point, and the body of the uterus being clearly felt in the lump posteriorly; this condition is called *procidentia uteri.*

Sometimes on asking the patient to strain, if there are certain abnormal conditions of the urethra or bladder, a little urine will escape.

Having learned all we can by examination of the vulva, we now pass on to the

Vaginal examination proper. — The forefinger of the right hand is lubricated (a convenient preparation for this purpose is glycerine containing 1 part of corrosive sublimate dissolved in 1000 parts of glycerine) * and passed along the perineum forwards over the anterior edge of the perineum, and so into the vagina. A small point, but one worth attending to, is to take care that the finger-nail is trimmed short, and does not project over the soft end of the finger; and it is also of importance to pass the finger into the vagina in the manner described, so that the more sensitive parts in front of the vaginal orifice may not be touched. Apart from any consideration for the patient, unnecessary pain renders the examination more difficult, and less likely to give useful information.

Points for special attention are:—1. On attempting to pass the finger into the vagina, it may be, that so much pain is caused, that the patient extends her legs, at the same time pressing her buttocks close together, so that the examination has to be given up; in such a position nothing whatever can be made out.

This is likely to occur when there is acute, or even sub-acute, inflammation of the mucous membrane of the vulva or vagina—vulvitis or vaginitis: in cases also of urethral caruncle, and labial abscess. Apart from such causes, it is likely to be met with in nulliparous women of emotional temperament. In such patients even merely touching the parts may set up this state of spasm. In these cases the patient must be completely anæsthetized before a satisfactory examination can be made.

2. *The condition of the vagina.*—Whether it embraces the finger closely, or is lax and capacious.

Its length: the canal is notably shortened in old age.

Presence or absence of the vaginal rugæ.

Tenderness on pressure in any particular direction, *e.g.*, pressure on the anterior vaginal wall causes pain in acute

* Some say that this preparation is not a good lubricant. I find it lubricates well if not left exposed to the air. It may be used from a wide-mouthed bottle; the stopper should always be replaced as soon as possible.

and subacute cystitis, while pressure in any other direction causes no pain in such cases.

Presence of foreign bodies, e.g., forgotten pessaries, pieces of sponge, etc.

Abnormal growths.—For instance, tumours growing from the vaginal walls; or from the uterus—fibroid polypi—or malignant growths—occupying the vagina.

The temperature of the vagina.

Having noted the state of the vagina, we pass on to examine the condition of the uterus.

Attention is first to be directed to the vaginal portion of the cervix—that part of the cervix projecting into the upper part of the vagina.

We attend to:—

(i) *The direction in which the external os uteri is pointing*, forwards or backwards. Normally it looks backwards and downwards.

(ii) *Whether the cervix is in the centre of the pelvis*, or to one side.

(iii) *The length of the vaginal cervix*—normally about $\frac{1}{3}$ inch—its *shape*, long and markedly conical for instance, or short and cylindrical. Sometimes the vaginal portion of the cervix is hypertrophied, and may even extend to the vaginal orifice. This latter condition is a congenital peculiarity.

(iv) *The shape of the external os and its size.*—Whether, for instance, it is a little round, or transverse, aperture some $\frac{3}{16}$ inch across, as in nulliparæ, the edges of it free from irregularities; or a wide aperture, $\frac{1}{2}$ inch or more across, with irregular edges admitting the tip of the finger, as in women who have had children. These irregularities in the outline of the external os are due to the slight lacerations that occur in every first labour. In old women the os uteri is often on a level with the roof of the vagina, owing to atrophy of the cervix; the cervix does not then project into the vagina at all.

(v) The surface of the vaginal portion should be felt all over by the examining finger, starting from the external os; thus we may detect the slightly granular feeling of an erosion round the os, its peripheral limit being a slightly raised margin beyond which the surface is felt to be perfectly smooth.

Little shotty lumps may sometimes be felt on the surface of the vaginal portion, or, when the os is patulous, often some way within the cervical canal.

Such little prominences may be due either to early malignant disease, or to occlusion of the apertures of gland ducts; these then becoming distended by their retained secretion.

In this last case, if the prominence be punctured with a needle through a speculum, the lump will disappear. Retention cysts of this kind are called *ovula Nabothi.*

(vi) We also note whether the cervix has been lacerated deeply on one or both sides. When there is a deep laceration, say on the left side, it will be found that the finger passes from the cervical canal (thus laterally laid open) to the vagina on the same side without anything intervening between the two; whereas on the opposite (right) side, the finger starting from the cervical canal has first to traverse the right half of the vaginal portion of the cervix before coming to the vaginal wall.

The bimanual examination.—This can be made equally well whether the patient lie on the left side, or on the back. It is merely a question of practice. The position on the side is far less unpleasant to the patient, and should therefore be generally adopted.

To perform it, the left hand is laid on the hypogastric region, and is pressed down into the pelvis as low as the state of the abdominal walls will allow. The hand should be so placed that the ulnar border from the first lies more deeply than the radial. Every endeavour should be made, as previously directed, to get the patient to relax the abdominal muscles. The left hand thus pressed down is kept quite passive while the finger of the right hand in the vagina, placed on the external os, tilts the cervix upwards; this of course imparts at the same time an upward impulse to the body and fundus of the uterus, so that the palmar aspect of the left hand pressed down in the way described receives an impulse, and so becomes informed of the whereabouts of the fundus uteri.

This being known, if the uterus is in its normal position, its body can be grasped between the fingers of the outside

hand, and the finger in the vagina, the latter now being carried in front of the vaginal portion of the cervix (Fig. 2).

If the bladder is full, even apart from any abnormal condition, the body of the uterus cannot be felt bimanually. If we are unable to feel the body of the uterus, a catheter should always be passed. After emptying the bladder, we are often able to feel the uterus bimanually in cases where we had previously failed to do so.

Even if the bladder is empty, we cannot, as a rule, feel the body of the uterus bimanually if the uterus be retroflexed, or strongly retroverted. If the abdominal walls are thin and

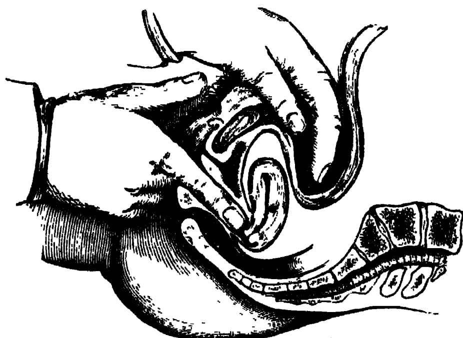


FIG. 2.—THE BIMANUAL EXAMINATION (Schroeder).

The body of the uterus is seen grasped between the fingers of the left hand pressing down in the hypogastrium, and the forefinger of the right hand in the vagina. Note that the bladder is empty.

very lax, we may, however, feel the body of the uterus bimanually, even when retroflexed or retroverted.

The mobility of the uterus will have been estimated when the finger in the vagina made the upward tilting movement on the vaginal cervix.

The normal range of mobility is about 1½ inches in the upward direction; the uterus may be absolutely immovable, or less movable than normal, or freely movable.

At the same time, a fair estimate may be made of the weight of the uterus, whether heavier than normal, or not.

It is of great importance, during the bimanual examination, to be able to form an estimate of the *size of the uterus*

(particularly with a view to the diagnosis of early pregnancy), also to ascertain whether its surface is smooth, or the seat of irregular projections (as when subperitoneal fibroid tumours of the uterus are present).

Supposing the body of the uterus cannot be felt bimanually, even when the bladder is empty, the internal finger should explore the region behind the cervix. Normally, when the rectum is empty, no lump should be felt in this situation. If we feel a lump there, it may be one of many things, *e.g.*, it may be a fæcal lump, or the body of a retroflexed uterus, it may be a hæmatocele, or a distended Fallopian tube, or an enlarged and prolapsed ovary. The passing of the sound will settle whether the lump is the body of the uterus or not.

The finger having felt in front of the vaginal portion and behind it—explored the regions called the anterior and posterior vaginal *fornices*—now goes on to examine the spaces at the sides of the cervix—the lateral fornices; and both without and with the aid of the bimanual method, note is taken of any masses to be felt in these regions. For instance, in parametritis (pelvic cellulitis) of one side, a lump is felt on that side of the cervix.

For the purposes of description it is usual to divide the pelvis into quarters, and speak of a lump being felt in the right, or left, posterior quarter of the pelvis as the case may be. The boundaries, for instance, of the right posterior quarter of the pelvis are:—the right broad ligament, the right utero-sacral ligament, and externally, the pelvic wall.

On withdrawing the finger from the vagina, it should be noticed whether there is any blood on it, or not. If there were no blood in the vagina to begin with, the occurrence of bleeding after gentle examination is suggestive of malignant disease.

To complete the examination we may use *the speculum*, and, if especially indicated, *the uterine sound.*

The two forms of speculum in common use are Fergusson's tubular speculum, and Sims' duckbill speculum.

Fergusson's is the one which will be found most generally useful. The chief objection to it is that it will not stand

disinfection by boiling. To disinfect it we have to rely on thorough washing, and placing it in an efficient antiseptic lotion, *e.g.*, $\frac{1}{1000}$ perchloride of mercury lotion for say two minutes. Fergusson's specula when made of metal are much inferior to those made of glass in illuminating the part under observation.

Sims' speculum, on the other hand, is essential for opera-

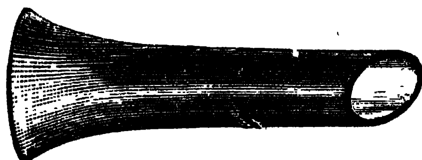


FIG. 3.—FERGUSSON'S SPECULUM.

tions on the vagina and cervix. It has the advantage that we can touch the cervix while the speculum is in position.

Other specula that are occasionally useful are Barnes' crescent speculum, and Cusco's bivalve speculum.

Directions for passing Fergusson's speculum.—Care should be taken to choose a size suitable to the capacity of the vagina, as already determined by the finger.

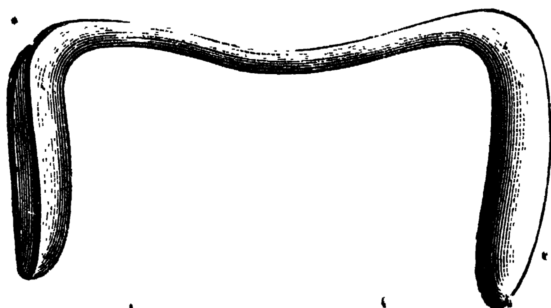


FIG. 4.—SIMS' DUCKBILL SPECULUM.

The forefinger of the left hand is passed a short way into the vagina, and retracts the perineum; at the same time the middle finger of the left hand draws the right labium to the right. The speculum is held in the right hand, and its end, previously lubricated (not dipped in the lubricant), is insinuated into the orifice of the vagina.

Special care should be taken not to tuck in any of the parts, *e.g.*, the nymphæ, or hairs. It is then pushed on, upwards, but with a strong inclination backwards, till it is completely passed.

Then, looking up the tube, we see if the vaginal portion



FIG. 5.—Retractor used with Sims' Speculum for pressing forwards the anterior vaginal wall, while the speculum presses back the posterior vaginal wall and perineum. An assistant at the same time should draw the patient's right buttock upwards.

of the cervix is in view, as it should be. If not, the speculum is turned round, or passed up a little further.

If the cervix is still not in view, the speculum should be withdrawn a little way, and again passed up.

The speculum enables us to see.—1. The condition of the vaginal mucous membrane—redder than normal, and if so

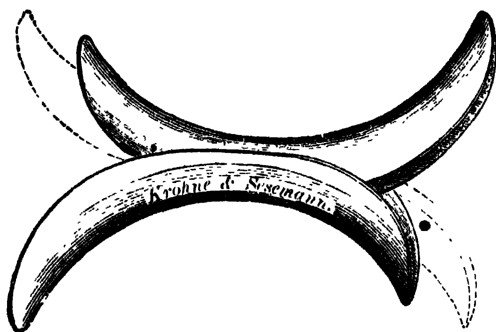


FIG. 6.—BARNES' CRESCENT SPECULUM.

One blade is first introduced, and then the other, so that, when in position, the blades lie somewhat as in the figure.

whether the redness is uniformly distributed, or confined to certain parts of the vagina, *e.g.*, the lower part or the upper part of the vagina, or, as in other cases, to the summits of the ridges of the mucous membrane, the intervals between the ridges being pale—or again, whether the whole mucous membrane is spotted over with red spots, the intervals between the spots being pale, as in "spotty" vaginitis.

2. *Presence of ulcerations in the mucous membrane.*—These may be syphilitic, malignant, tubercular, or produced, as is often seen, by the use of hard pessaries. Sometimes we cannot assign any cause for them.

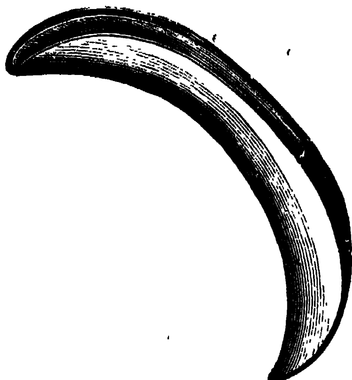


FIG. 7.—BARNES' CRESCENT SPECULUM.
The blades packed for carrying, one within the other.

3. *The presence and character of various discharges in the vagina.*—Merely, as is natural, a little whitish fluid just sufficient to moisten the surface; or a copious white, or yellow, or greenish-yellow fluid, or blood.

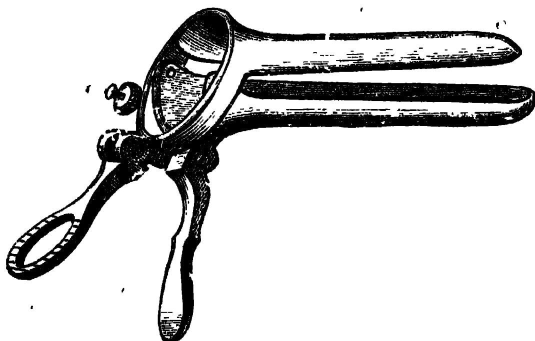


FIG. 8.—CUSCO'S BIVALVE SPECULUM.

4. *The secretion in the external os.*—Normally clear, transparent, and viscid, like unboiled white of egg. In catarrh of the cervix, it loses its transparency and becomes opaque, and either white or yellow, according to the intensity of the

inflammation. Often a red, raw-looking, slightly granular, or even villous area is seen of varying width immediately around the external os. Such areas constitute the various forms of erosion of the cervix. There is some diversity of opinion as to the origin of these erosions. By some they are regarded as probably indicating coexisting inflammation of the cervical mucous membrane. By others they are regarded as having an adenomatous rather than an inflammatory origin.

5. *The actual size and shape of the external os.*

The speculum is also useful for the application of various medicated fluids to the surfaces within reach.

It will often be found that what appears to be a wide erosion, when the speculum is pressed well up, becomes much diminished in width if the speculum is withdrawn a little way; the former appearance being due in part to an eversion



FIG. 9.—THE UTERINE SOUND (Simpson's).

The side of the handle corresponding to the concavity of the sound is roughened: the other side of the handle should be smooth. There is an angular projection $2\frac{1}{2}$ inches from the point of the sound, this being what is called "the normal distance" for the sound to pass into the uterus. The knobs nearer the handle are placed at intervals of an inch from the angular projection just mentioned. In some patterns of sound these distances are indicated by notches: this is undesirable, as such notches make the instrument more difficult to keep clean.

of the mucous membrane of the cervix. Such eversion occurs in cases where the cervix has been more or less deeply lacerated on one or both sides.

The examination may with advantage end here in many cases. If the art of making the bimanual examination has been thoroughly mastered, the cases where the use of the sound will add much to our knowledge are comparatively few.

The sound should not be used where there is any likelihood that the patient may be pregnant; nor should it be used in cases of pelvic inflammation (pelvic peritonitis and cellulitis), nor in cases of malignant disease, nor during a menstrual period. Nor should it be used when there is vaginitis, nor, in general terms, when there is any obviously offensive or morbid matter in the vagina, unless absolutely necessary, and then it should be passed through a speculum.

There are three principal safeguards against passing the sound into a pregnant uterus.

First.—It is always well to ask when the patient menstruated last.

Second.—The examination of the abdomen will prevent the risk of passing the sound in advanced pregnancy.

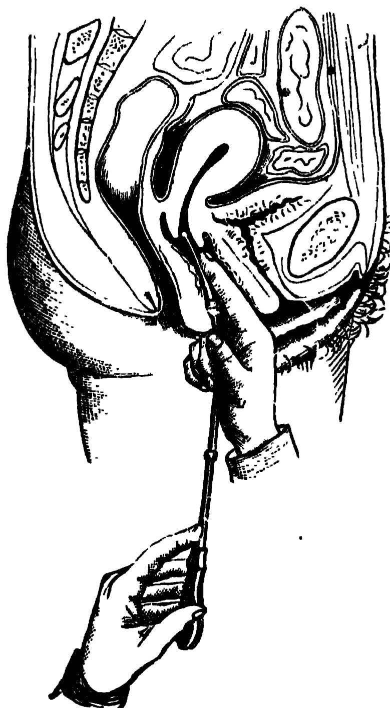


FIG. 10.—To illustrate the mode of passing the sound described in detail in the text (Hart and Barbour).

Third.—The bimanual examination, by enabling us to estimate the size of the uterus, will put us on our guard as to early pregnancy.

There are many patterns of uterine sound. Simpson's is, on the whole, the one to be preferred. It is certainly as good as any, and better than most. The whole of the sound, including the handle, should be made of metal, so that it can be boiled or otherwise sterilized. A convenient method

of sterilizing the sound in the consulting-room immediately before using it is to heat the distal 3 or 4 inches in the flame of a spirit-lamp. The sound is then cooled by placing it in an antiseptic lotion, such as lysol (ʒj to Oij water).

Directions for passing the uterine sound.—The fore-finger of the right hand being on the external os, the sound, previously sterilized as described above, is passed with its concavity looking backwards along the palmar aspect of the finger, keeping the point of the sound especially in close contact with the finger, till it reaches the external os. It is then gently slipped into the os ; it will find its way easily as far as the internal os.

Here a slight check is usually met with. If the previous examination has shown the body of the uterus to be in its normal position of slight anteflexion, the direction in which the concavity of the sound looks will have to be changed, so that it may look forwards ; then steady gentle pressure will cause it to pass into the body of the uterus.

If, however, the uterus be retroverted, or retroflexed there will be no necessity for altering the direction in which the concavity of the sound looks. It will only be necessary to carry the handle of the sound somewhat forwards towards the pubes as it passes into the uterus, its concavity looking backwards as at first.

It is very important to thoroughly understand the manœuvre for changing the direction in which the concavity of the sound looks.

The student should take a sound and follow the directions to be given, looking at Fig. 11.

Place the sound flat on the table in the position *a*, *b*, *c*. Now hold the points *a* and *b* closely against the table, so that the part of the sound *a b* cannot be displaced laterally.

Now take hold of the handle *c* with the other hand.

Raise it off the table, and bring it down again to the position *c′*. It will be found that the handle *c* passes through a semicircle to the position *c′*, without causing any displacement of the part *a b*, which merely rotates on its own axis. This altering of the direction in which the concavity of the sound looks, without displacement of the terminal part *a b*, is called the "*tour de maître.*"

When we consider that there is often septic matter in the vagina, it is obvious that if we pass the sound in the manner described in the last paragraph, there is considerable danger of carrying some of it into the cavity of the uterus with the sound. If this is done, pelvic inflammation will probably be set up, and may even end fatally. This is one reason for restricting the use of the sound to cases where it is absolutely necessary either for diagnosis or treatment—a relatively small number.

In every case where the sound is about to be used, it

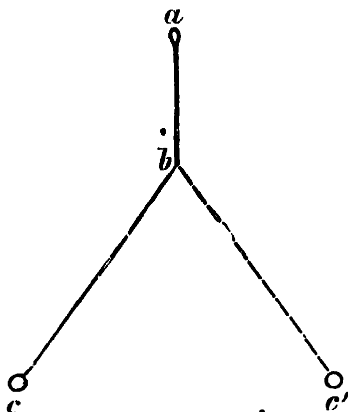


FIG. 11.

should be made scrupulously clean by scrubbing with soap and soda, and sterilized as described above. If there is no contra-indication, such as narrowness of the vaginal orifice, it is better to expose the cervix with a Sims' speculum, then thoroughly swab the cervix with an efficient antiseptic lotion such as perchloride of mercury lotion $\frac{1}{1000}$, and then pass the sound.

Rectal examination.—Sometimes it is an advantage to examine with the finger in the rectum. In this way we notice :—

1. *Whether the rectum itself is diseased, e.g.*, stricture ; or whether a foreign body is present, as in a case I remember, where a large gallstone was impacted in the rectum.

2. It is ascertained for certain whether masses felt to the left and behind are fæcal, or due to some pathological con-

dition of the pelvic organs, *e.g.*, distinction between fæces and an enlarged left ovary.

3. In young girls and unmarried women, where some examination is called for, examination should be made per rectum first; the condition of the pelvic organs can thus be ascertained without rupturing the hymen.

For example, an unmarried girl, about 18, was brought to me on account of a more or less constant red discharge from the vagina. On examination per rectum, I felt a mucous polypus the size of an almond hanging from the os uteri. As the only effectual treatment would be removal of the polypus, a vaginal examination was then made, confirming the result already obtained. Of course, if nothing abnormal had been found on rectal examination, no vaginal examination would have been made.

The catheter.—The frequent necessity of passing the catheter in the course of a physical examination of the pelvic organs has been already alluded to.

Indeed, provided that he has a catheter to ensure the bladder being empty, the experienced gynæcologist can as a rule obtain all the information he requires by the digital and bimanual methods of examination alone. To put it another way, the catheter is a more indispensable instrument than the speculum, and a far more indispensable one than the uterine sound.

Moreover, after many operations—*e.g.*, ovariotomy, hysterectomy, operations for ruptured perineum, &c.—the catheter has to be passed two or three times in the twenty-four hours.

It is therefore important to remember that cystitis is very apt to be set up by its use, unless special care be taken.

Precautions to be observed in using the catheter.—1. If there is any discharge about the external parts, this must first be thoroughly wiped away with a pledget of cotton-wool soaked in $\frac{1}{2000}$ perchloride of mercury lotion. The orifice of the urethra should always be disinfected as well as possible by cotton-wool soaked in $\frac{1}{2000}$ perchloride of mercury lotion before the catheter is passed.

2. The kind of catheter used is an important point. It is impossible to feel sure that the ordinary catheter with the eye at the side, and a space beyond the eye, is clean, for it

may be taken as certain that dirt will accumulate in the part beyond the eye. A satisfactory instrument is a male celluloid catheter having an eye at the side, *but the part of the catheter beyond the eye solid* (Fig. 12).

3. Before use the catheter should be boiled for a period not exceeding five minutes. It should then be dipped in corrosive sublimate lotion ($\frac{1}{1000}$), then in sterilised oil or in a solution of perchloride of mercury in glycerine ($\frac{1}{5000}$); after use it should be immediately washed, first by passing a stream of water through by holding it under a tap. Then it should be thoroughly scrubbed with soap and water. Celluloid catheters will stand boiling for a period not exceeding five minutes. This is the best way to sterilize them before and after use. As a rule, where a very long catheter is unnecessary, a glass female catheter is to be preferred. In



FIG. 12.

the consulting-room it can be boiled in an ordinary test-tube before use.

There is a certain slight risk in using glass catheters. The catheter may break, and part of it remain in the bladder. I saw a case of this once. The patient was in labour, and having strong pains. I was about to perform Cæsarean section, and a glass catheter was passed by a most careful and experienced nurse, as usual before an abdominal section. While the glass catheter was in the bladder the patient had a pain, and strained violently; the catheter broke, about half of it remaining in the bladder. I performed the Cæsarean section, and afterwards dilated the urethra with Hegar's dilators till I could get my finger in, and then extracted about half the catheter with polypus forceps. The patient did well, and had no incontinence, or any trouble with the bladder at all, after the operation.

On dilatation of the cervix.—The two methods of dilating the cervix in common use in this country are:—

1. The rapid method by means of Hegar's dilators. 2. The gradual (slow) method by means of tents.

The choice between them depends on the kind of case in which dilatation is to be employed.

The rapid method is especially preferable where dilatation is required at no long time after a confinement or miscarriage; and it is also far the best method when dilatation of the cervix is undertaken during the earlier months of pregnancy, for the

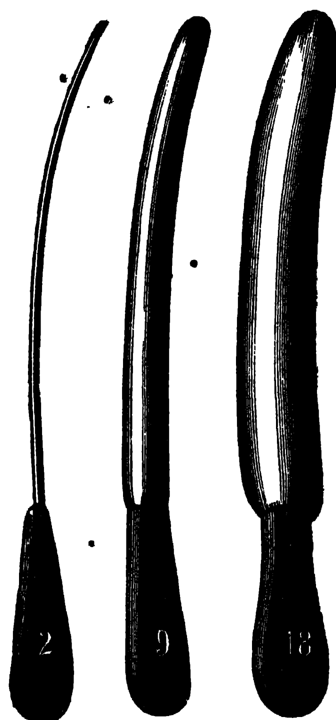


FIG. 13.—HEGAR'S DILATORS.

purpose of removing the ovum, either on account of its degeneration into a mole, or for some other reason.

In the class of cases referred to the cervix is soft, and dilates readily to the extent necessary to allow the finger to pass the internal os uteri. Apart from pregnancy, the cervix is often similarly soft and dilatable in some cases of *uterine fibroids.*

On the other hand, when the cervix is not soft, rapid dilatation, to the extent needed to allow the finger to pass

into the uterus, is almost certain to be attended by more or less laceration of the cervix; in fact, in such cases rapid dilatation means laceration. As a general rule, therefore, when dilatation is required for exploration, if the patient is not pregnant, or if she has never been pregnant, or if some long period has elapsed since the last pregnancy, or in any case where the cervix feels rigid, the rapid method should

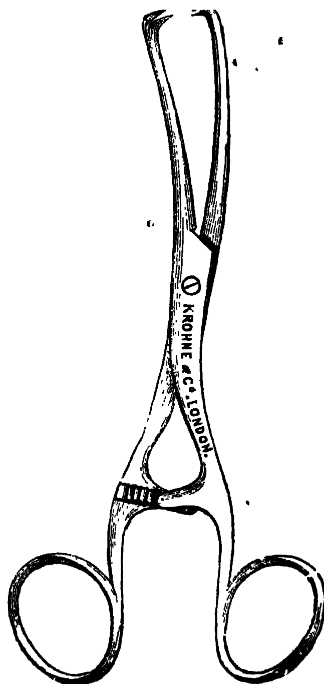


FIG. 14.--THE VOLSELLA.

The instrument figured has a catch at the handles like Spencer Wells' forceps.

not be employed alone. In such cases the best plan is to use one or more specially prepared laminaria tents. For example, say these are passed at five o'clock on one afternoon; then the next afternoon at two o'clock we can remove the tents, and perhaps find sufficient dilatation has been produced to allow the finger to pass; but if this is not quite the case, the cervix has been softened and rendered easily dilatable by the action of the tents, and we can readily

complete the dilatation with Hegar's dilators without any risk of laceration. The laminaria tents I am in the habit of using are kept in a $\frac{1}{1000}$ solution of corrosive sublimate in absolute alcohol; they are thus rendered both aseptic and antiseptic. Just before inserting them they are put in a bowl of hot carbolic lotion $\frac{1}{40}$, and each tent is lubricated with glycerine containing perchloride of mercury ($\frac{1}{1000}$). Dipping them in the watery carbolic lotion seems to facilitate the subsequent expansion of the tent.

Dilatation by means of tents, unless the most careful antiseptic precautions are observed, is not uncommonly followed by more or less severe attacks of pelvic inflammation, peri- or parametritis, and several deaths from their use have been recorded. There is especially great risk in inserting a second tent or series of tents when sufficient dilatation has not been produced by those inserted at first.



FIG. 15.—TUBE FOR WASHING OUT THE UTERUS.

The india-rubber tube of an ordinary douche apparatus fits on A. The horse-shoe shape of the tube on transverse section at any part (say B) is shown. The fluid injected at A passes between the walls of the tube as at C. This fluid, after escaping from the holes at the distal end, returns along the groove D, which runs on the under surface of the tube for its whole length.

1. *Rapid dilatation of the cervix.*—Hegar's dilators are the instruments most commonly employed for rapid dilatation. They are slightly curved, metal cylinders, about 3½ inches long, the distal end forming a blunt cone, and the proximal being fitted with a handle. There are twenty-six sizes usually supplied, the transverse diameter varying from $\frac{1}{12}$ inch to 1 inch (see Fig. 13). The method of using them is as follows:—The patient is put in the lithotomy position, and the vagina thoroughly syringed with some efficient antiseptic, such as $\frac{1}{1000}$ corrosive sublimate solution. Sims' speculum is introduced, and the anterior lip of the cervix seized with a volsella, preferably one having a catch at the handles, like Spencer Wells' forceps (Fig. 14). The direction of the uterine cavity is then ascertained with an ordinary sound. The dilators, sterilized by boiling, should have

been previously placed, in numerical order, in a shallow sterilized tray, and covered with either sterilized water, or $\frac{1}{40}$ carbolic lotion. One of the dilators corresponding to the supposed calibre of the cervical canal is then dipped in sublimate glycerine ($\frac{1}{1000}$), and passed through the cervix, which is held steady by the volsella in the left

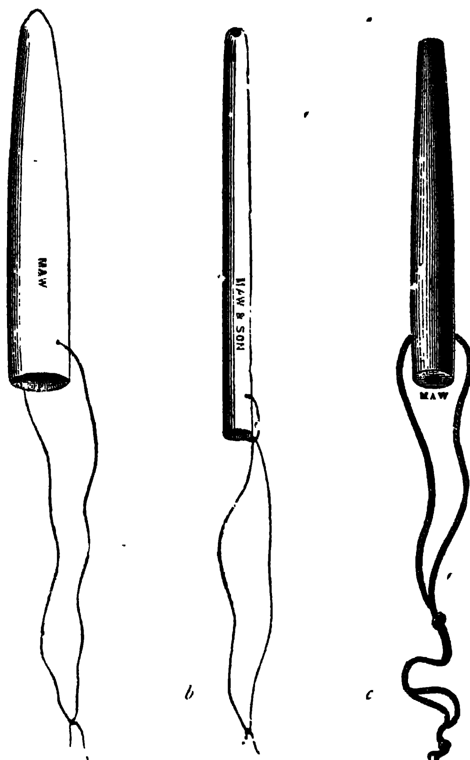


FIG. 16.—UTERINE TENTS.
a. Sponge. *b.* Laminaria. *c.* Tupelo.

hand. If the dilator used only passes with difficulty, it is held in position a minute or two before withdrawing. It is important to have the next larger size ready to pass at once after withdrawing each dilator. In this way the dilators are passed, one after the other, till the cervix is sufficiently open to admit the finger. This degree of dilatation is usually obtained after No. 19 of the series has passed. If any morbid

condition is discovered in the cavity of the body of the uterus, this is treated by suitable means. Polypi, for instance, or pieces of placenta can be removed.* If a growth of doubtful



FIG. 17.—UTERINE FORCEPS.
With a catch near the handles, like Spencer Wells' forceps.

character is discovered, a small portion may be removed for microscopical examination. Whether anything abnormal

* I once removed a piece of sponge from the cavity of the body of the uterus. A sponge tent had been used some weeks before by some one else; afterwards the patient had a profuse, purulent, and somewhat offensive discharge. I dilated the cervix with Hegar's dilators, and found a flattened piece of sponge, about ¾ inch long by ¼ inch wide, lying loose in the uterine cavity.

has been found in the interior of the uterus or not, it is well to apply pure tincture of iodine to the endometrium, and afterwards to wash out the uterus with hot iodine water (ʒij. Tr. Iodi to the pint of water). For washing out the uterus nothing answers better than the double-channelled tube shown in Fig. 15. No matter how tightly the tube may

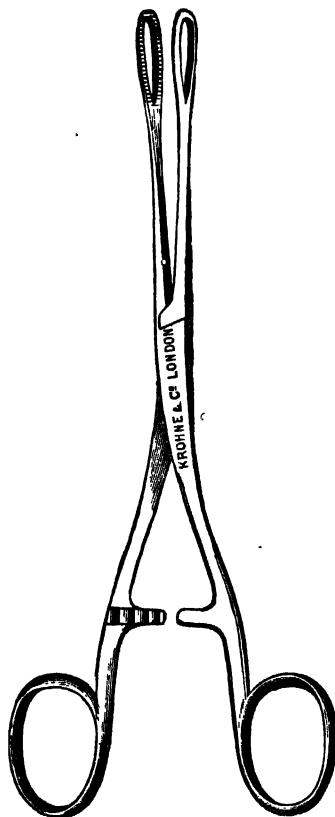


FIG. 18.—SPONGE-HOLDER.

be grasped by the uterus, the fluid injected readily escapes along the deep groove on the under surface. These tubes should always be made of glass. When it is necessary to wash out the uterus after delivery, I also use a glass tube of the same pattern. The tubes made of celluloid cannot be effectually cleaned. The objection to the glass tube that it

is easily broken can be met by having a plain wooden box made to carry the tube when not in use. Subsequently the patient should have antiseptic vaginal douches twice a day for a few days; iodine water (ʒij. Tr. Iodi, Oj. water) is the antiseptic I usually employ for this purpose.

2. *Dilatation of the cervix by tents.*—Tents are made of sponge, laminaria (sea-tangle), or tupelo, a kind of wood (Fig. 16).

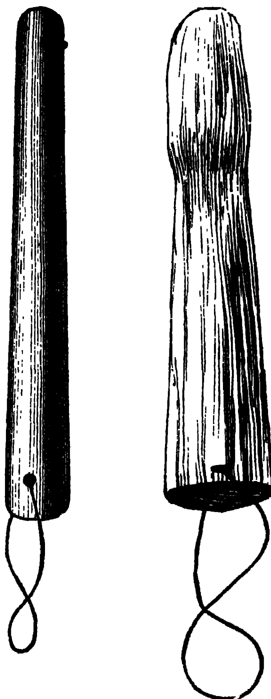


FIG. 19.—EXPANSION OF A TUPELO TENT (Mundé).
The larger figure shows the tent after expansion. The constriction indicates where it has been in contact with the internal os uteri.

They possess the property of absorbing moisture, and, expanding as they do so, exercise a dilating force on any part into which they have previously been tightly fixed.

If dilatation by tents has been decided on, it is, to begin with, essential that the patient should remain in bed, not only during the dilatation, but for some days afterwards. A vaginal douche of corrosive sublimate solution $\frac{1}{1000}$ is given. The

cervix is now exposed with Sims' speculum, and, if necessary, steadied with a tenaculum, or one lip of the cervix may be held, and drawn down slightly with a volsella. The tent, previously anointed with sublimate glycerine $\frac{1}{1000}$, is held with a pair of uterine forceps (Fig. 17), or better with a long sponge-holder having a catch at the handle (Fig. 18), and passed into the cervix, so that its highest point may be well beyond the internal os. If there is room for more than one tent, another is inserted by the side of the first, and so on. Just before the tent is inserted it may be left for a minute or two in either sterile hot water, or in a hot watery antiseptic solution, such as 1-40 carbolic. Expansion of the tent takes

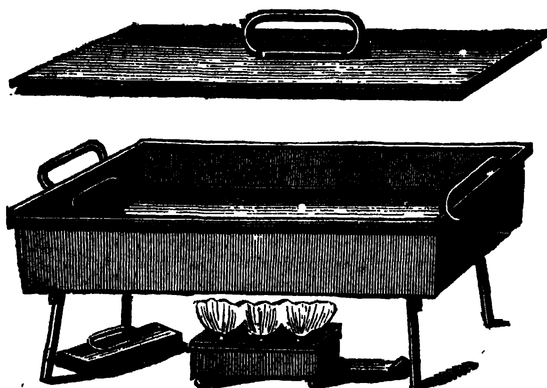


FIG. 20.—PORTABLE STERILIZER.

place better when this is done. It is best to insert a plug of sterile white gauze into the vagina up against the cervix to keep the tents in place.

Tents are left in about twelve hours. When tents specially prepared, as mentioned above (p. 31) are used, and every other antiseptic precaution adopted, they may be left in from twenty to twenty-four hours without any ill effect. When the gauze is removed, an antiseptic douche should be given before removing the tents. After removal of the tent, or tents, a further quantity of the antiseptic douche should be used, and the finger is then passed into the cavity of the body of the uterus; the recognition and treatment of any morbid condition discovered is conducted as described on page 33, under

rapid dilatation, not omitting the final washing out of the uterus through the intra-uterine tube (Fig. 15) with a suitable antiseptic lotion.

Formerly, when the necessity for strict asepsis was not understood, dilatation often caused great pain. This is practically unknown nowadays, when tents are used as described above. Only rarely does the patient experience more than a little discomfort.

A suppository of morphine (gr. ¼) may be left with the nurse to be used if necessary.

Sterilization of instruments and appliances.—Instruments should be made of metal or glass, so that they may be either boiled for a quarter of an hour, or subjected to dry heat at 150° C. in a hot-air bath for an hour. Boiling is the more generally convenient plan. The water should contain 1 per cent. of soda. At the London Hospital in my theatre the boiling is done by means of super-heated steam circulating outside the sterilizer. When something has to be boiled, the steam is turned on to the particular sterilizer in question, and its contents boil very quickly.

Elsewhere than in Hospital, for instance in Nursing Homes, the boiling is generally done by gas. For operations in private houses a portable sterilizer is required, in which the water is boiled by means of a spirit-lamp with a large flame. The instruments are taken direct out of the sterilizer, and placed in a boiled tray containing cold sterile water, or cold carbolic lotion 1-40. All trays and bowls used in any operation should be boiled. In Hospitals and well-equipped Nursing Homes a large specially-made vessel is used for boiling trays and bowls. In private houses these may be boiled in a very large fish-kettle. Enamelled iron trays and bowls are the best. Porcelain and glass are constantly getting broken, and they are besides heavier, which is a consideration in the case of operations at a distance. Of course they must not be touched until the hands have been sterilized as completely as possible.

Preparation of the hands for operations.—A satisfactory plan for rendering the hands practically aseptic is the following: The nails must be kept short, and never cleaned out with a knife or other pointed instrument, which only causes an appear-

ance of cleanliness. The nails, hands, and forearms are to be first *thoroughly* scrubbed with soap and hot water containing a little lysol, ℥ij., for instance, to an ordinary basin of water, and a clean nail-brush. They should then be again thoroughly scrubbed with soap in a fresh supply of hot water containing an excess of tincture of iodine. A little is of course decolorized by the soap, but it is easy to have an excess of free iodine. At least five minutes should be spent in scrubbing the hands and nails. The hands are then rinsed in plain water to get rid of all the soap, and then are to be thoroughly scrubbed in a solution of biniodide of mercury *in spirit* 1-500, and finally they are scrubbed in perchloride of mercury lotion $\frac{1}{1000}$. Another nail-brush, never used for soap, is employed for scrubbing in the biniodide and perchloride of mercury solutions. The hands should be scrubbed in the perchloride lotion for at least two minutes. After taking the hands out of the perchloride lotion they should be rinsed in sterile water, and then they are ready for work. They must not be allowed to touch anything that is not aseptic.

All instruments must be thoroughly scrubbed with soap and washing soda in hot water before being sterilized.

India-rubber gloves.—As a general rule, after preparing his hands as above, the operator should put on a pair of india-rubber gloves previously made ready as follows. They are first scrubbed thoroughly with soap and water inside and out, and are then boiled. They are lifted out of the boiling water with a pair of boiled forceps (for instance, dissecting forceps) and placed in cold sterile water; or, if a reliable supply of that is not available, in a weak perchloride of mercury lotion (1-5000). After putting on the gloves the hands should again be scrubbed in perchloride of mercury lotion (1-1000).

Preparation of silk.

Silk should be unwound from the skein, and loosely wound on pieces of stout linen. It should be tied up in a piece of muslin, which has been previously well washed. The silk should then be boiled in a large vessel of water (without soda of course) for two hours. The water should be changed two or three times during this period, and the scum, which collects on the surface, removed from time to time.

The silk is then wound on sterilized glass reels (it need hardly be said with hands rendered as thoroughly aseptic as possible, and wearing sterile india-rubber gloves) and the reels are tied up in the muslin, and boiled again for a quarter of an hour. They are then placed in a boiled wide-mouthed glass bottle containing $\frac{1}{20}$ carbolic lotion. A piece of boiled mackintosh is tied over the top of the bottle. If the silk is not going to be used at once, it should be kept in 2½ per cent. solution of carbolic acid in methylated spirit.

Preparation of fishing-gut.

Fishing-gut sutures should be sterilized by boiling for an hour. They should then be placed in a boiled bottle containing $\frac{1}{20}$ carbolic lotion. If the fishing-gut is not going to be used at once it should be placed in 2½ per cent. carbolic lotion *in spirit*. Both silk and fishing-gut should be freshly boiled for five minutes just before each operation. Catgut cannot be boiled, as water spoils it.

Preparation of catgut and sponges.

The details of the method adopted at the London Hospital for sterilizing catgut, both plain and chromicized, have been given me by Mr. Gunthorpe, the Superintendent of the Operating Theatres there. The method is as follows :—

The catgut is wound loosely in a single layer, with the ends secured, on glass reels ; or cut into ligature lengths, and made into bundles of three ligatures secured with a rubber band. These reels and bundles are put into a glass jar with a tap at the bottom, and covered with ether for twenty-four hours.

At the end of this time the ether is replaced by a 1 per cent. solution of Hydrarg. Biniod. in methylated spirit, in which the catgut remains for twenty-four hours, and again for a further forty-eight hours in fresh biniodide solution of the same strength. The catgut so prepared is kept ready for use in 2½ per cent. solution of carbolic acid in methylated spirit.

Marine sponges cannot be boiled ; there are several methods of rendering them sufficiently aseptic for practical purposes. That in use at the London Hospital is as follows :

The sponges (bleached), both Flat Turkey and Round Honeycomb, are washed * in many changes of warm water, until perfectly free from sand, shell, or other foreign body. They are then dried, packed into earthenware jars, and covered with 5 per cent. solution of carbolic acid in water, in which they remain for twenty-one days, after which time they may be used.

After use on "clean" cases the sponges are washed in cold water, followed by warm 2 per cent. solution of carbonate of soda. When thoroughly clean they are rinsed in warm water, dried, and sterilized again as above.

Sponges for abdominal section.—*In ovariotomy* and similar operations I prefer using artificial sponges made of Gamgee tissue. These can be boiled. New ones can be used each time, as the material is so cheap. For abdominal work, pieces of Gamgee tissue are cut out of suitable size, and the layers of netting are sewn together round the margin to prevent pieces of the wool getting loose. I have used such artificial sponges for many years, and find them very satisfactory.

I tie them up loosely in muslin, and boil them in a large fish-kettle for two hours, changing the water several times. As, at each change, the boiling is interrupted, the process takes really longer than two hours. They are then wrung out, and placed in a boiled glass jar containing $\frac{1}{20}$ carbolic lotion.

They should be freshly boiled within forty-eight hours of the operation at which they are to be used.

* This washing is done on a galvanized wire strainer or tray of about one inch mesh, standing in, and raised an inch or two from the bottom of, a deep sink. This arrangement keeps the sponges away from the sand, etc, which settles to the bottom of the sink. During the process of washing the sponges are lifted quickly from the water and held before a powerful lamp, when small particles of shell, etc., not easy to wash out, may be seen, and removed by fine forceps.

CHAPTER II.

MENSTRUATION AND ITS DISORDERS.

Normal type.—*In this country menstruation usually first appears between the ages of fourteen and fifteen. It is not very rare for it to appear as early as ten, or to be delayed as late as twenty. In hot countries it appears a little earlier,* and in cold countries a little later, than in temperate climates. Thus, according to Dudley, in the United States the age of onset is about the same as in England—fourteen or fifteen; in the Arctic regions, sixteen; and in the tropics, ten or eleven.

Menstruation generally ceases between forty-five and fifty. Menstrual life covers a period of thirty to thirty-five years. The earlier the age at which menstruation begins, the later the age at which it ceases. Similarly, the later it starts, the sooner it ceases.

When menstruation has become thoroughly established, it recurs every four weeks—*i.e.* from the *beginning* of one period to the *beginning* of the next is four weeks; sometimes it occurs every three weeks without there being any abnormality.

Both at the time of the establishment of the function and for some time before its cessation, some irregularity as to periodicity is commonly observed. For instance, after the first menstruation the girl often "sees nothing" for some months before it reappears, and there may be a similar interval before it recurs a third time; finally she becomes "regular" every four weeks. This is altogether within physiological limits.

Each period lasts from three days to a week. The quantity of blood lost varies in each particular case. It is difficult to measure the quantity accurately, but a quantity

of from three to six or eight ounces is within the limits of normal.

At first the discharge is pale in colour, and consists largely of mucus and leucocytes; afterwards it consists chiefly of blood, with a few epithelial cells from the body of the uterus, and some vaginal epithelium as well. Normally there are no clots passed. If the discharge is only moderate in amount, clotting is prevented by the mixing of the acid vaginal secretion with the blood If the quantity lost is much greater than normal, or if the blood is retained in the cavity of the uterus for some time, clots are formed.

The blood discharged during menstruation comes from the mucous membrane of the body of the uterus. The mucous membrane of the cervix contributes mucus to the menstrual fluid, but no blood.

Formerly the escape of blood from the cavity of the uterus was thought to be due to disintegration and shedding of its lining membrane to a greater or less depth Views of this kind were based on observation of specimens in which sufficient care was not taken to exclude the possibility of the changes observed being the result of pathological processes, or post-mortem damage. It is now believed that no disintegration or shedding of the mucous membrane takes place during normal menstruation.

Anatomical changes during menstruation.

1. *A premenstrual congestion of the blood-vessels* of the endometrium occurs. There is then an escape of leucocytes into the stroma, and these make their way between the epithelial cells either into the cavities of the uterine glands, or on to the surface of the endometrium The epithelial cells furnish a secretion of mucus at the same time.

2. Rupture of capillaries occurs in the sub-epithelial stroma, and small quantities of blood collect under the epithelium lining the uterine cavity constituting what have been called the *sub-epithelial hæmatomata.* The covering layer of epithelium gives way, and thus the blood becomes free on the surface of the mucous membrane. It is said that the flaps of epithelium, raised up and broken through in the process, to a large extent, fall back into place after the escape of the blood from the spaces beneath them. A little of the

ANATOMY OF MENSTRUATION. (From Dudley, modified from Gebhard.)

FIG. 1. Stage of pre-menstrual congestion.
FIG. 2.—Stage of sub-epithelial hæmatomata.
FIG. 3. Stage of bursting of blood through the surface epithelium (× 90).

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epithelium may, however, be broken off, which becomes mixed with the escaping blood, and may so be found in the menstrual fluid on microscopical examination.

Ovulation (that is, the maturation of a Graafian follicle, and discharge of its ovum into the Fallopian tube) is associated with menstruation, and is probably controlled by the same nervous mechanism. Ovulation may coincide in time with menstruation, but it often also occurs in the intermenstrual interval, or even when menstruation is altogether absent. For example, pregnancy may occur in a girl who has not as yet menstruated, or it may occur during lactation when menstruation is generally absent. Similarly, menstruation may occur without ovulation; for when an abdominal section is performed during, or immediately after, a menstrual period it often happens that no recently ruptured Graafian follicle is to be seen.

General phenomena associated with menstruation.

(*a*) There is increased vascular tension for some days before the period, falling during and after it.

(*b*) The temperature is a little raised (about half a degree) for some days before the flow, similarly falling again during and after it.

(*c*) Some feeling of *malaise*, with perhaps slight backache and hypogastric discomfort, is usually found during menstruation, even in healthy subjects.

(*d*) The breasts may swell, and become painful.

(*e*) At the time of puberty, when menstruation is about to occur, some enlargement of the thyroid may occasionally be observed, which generally passes off as the function becomes fully established.

Dr. Blair Bell's researches tend to show that there is a causal relation between the proportion of calcium salts present in the blood and the menstrual process. He finds that there is always a drop in the proportion of calcium present in the blood just before the menstrual bleeding begins; also that the leucocytes, which escape at the beginning of menstruation, are active agents in excreting calcium, since, by the method of investigation adopted, he not only found calcium in the fluid part of the discharge at this time, but also demonstrated the presence of calcium salts within the leucocytes them-

selves. He also found that, when the menstrual discharge has become practically blood, this menstrual blood contains a larger proportion of calcium salts than the systemic blood at the same time. He believes that the calcium metabolism of the organism is largely influenced by the secretion of the ductless glands—the ovaries, the adrenals, the pituitary, and the thyroid.*

Abnormalities of Menstruation.

Menstruation may never appear, or, having appeared, may become suppressed. If it has never appeared, we call the condition *Primary Amenorrhœa*; if it has appeared and subsequently become suppressed, we call it *Secondary Amenorrhœa.*

Again, menstruation may be attended with pain, and we have the condition called *Dysmenorrhœa.*

Lastly, either the quantity of blood lost at each period may be excessive, or menstruation may recur at too short intervals; in either case we have the condition termed *Menorrhagia.*

Amenorrhœa.—It has already been mentioned that menstruation begins in most cases between fourteen and fifteen, but that it may be delayed as late as twenty without there being necessarily anything wrong. At the same time it is to be remembered that the longer its first appearance is delayed beyond the usual time, the greater is the probability that some constitutional disease, or local abnormality, is present.

Apparent Amenorrhœa.

Menstruation may seem to be absent where, in reality, the function is being regularly performed every month. This is due to some *physical obstruction preventing the escape of the blood.* Such cases are rare. The obstruction is either due to an *imperforate hymen*, *a congenital or acquired occlusion of the vagina*, or *occlusion of the external os uteri.*

* Those wishing for further information are referred to Dr. Blair Bell's interesting paper, "Menstruation and its Relationship to the Calcium Metabolism," published in *Proc. Roy. Soc. Med.* (Obstetrical and Gynæcological Section), 1908, vol. i., p. 291.

Acquired occlusion of the vagina occurs occasionally after severe specific fevers, such as scarlet fever; the vaginal walls slough, and the granulating surfaces left cohere, so as to close the canal. This may also occur after difficult labour.

The possibility that the amenorrhœa may be due to some physical obstruction should always be thought of when a girl, who has arrived at the age of puberty, but who has never menstruated, experiences pain in the hypogastrium, recurring every month. After a time gradual dilatation of the cavities above the obstruction occurs, and a tumour is generally noticed rising out of the pelvis. It may be found that the swelling so formed increases in size when the pains in the hypogastrium occur each month, and diminishes again after the pains subside.

The increase in size corresponds to the menstrual period, when more fluid is added to that already in the dilated vagina, or dilated uterus, as the case may be; after the period is over, some of the fluid is reabsorbed, and hence the diminution noticed in the intervals between the periods.

The *treatment* proper for such cases will be referred to in the chapter on Diseases of the Pudendum.

AMENORRHŒA PROPER.

1. *In most cases true amenorrhœa is to be looked on as an indication, and as a result, of a bad state of the general health.*—It is in this way that amenorrhœa results from *anæmia*, and particularly the peculiar form of anæmia called *chlorosis*; from *overwork*, especially *overwork indoors* (as in the case of domestic servants, shop girls, etc.); that it follows severe illnesses, and various organic diseases, especially *phthisis*.

In all these instances failure of the general health is the cause of the amenorrhœa.

2. *Sometimes, on the other hand, deficient ovarian activity—deficience of the internal secretion of the ovaries—with which is associated amenorrhœa, seems to be the cause of the failure of the general health, and resulting anæmia or chlorosis.*—Here the fault may be supposed to lie with the ovaries, which perform their functions sluggishly. The close connection

between the functional activity of the ovaries and menstruation is seen from the fact that girls whose ovaries have been removed before the age of puberty never menstruate at all; and that women from whom both ovaries are completely removed, as a rule cease to menstruate.

If the changes in the whole body, which occur at the age of puberty, are to be accomplished without injury to the general health, the demand made on the strength by the rapid development in progress must be met by a corresponding activity in the processes of nutrition.

It may reasonably be supposed that the proper action of the ovaries gives an important impetus to nutrition at this juncture; if this impetus is not supplied, owing to sluggishness of the ovaries, nutrition is not sufficiently active, the strength is unequal to the demands made on it, the health fails, and chlorosis supervenes.

Sometimes when there is deficient ovarian activity and also amenorrhœa, there may be a condition of plethora, and this may after a time be replaced by chlorosis.

3. *There is an irregular group of cases where we cannot be certain what the cause of the amenorrhœa is.*

Thus amenorrhœa sometimes follows:—A change in the mode of living, particularly change of air from the country to London, and *vice versâ*; or some disappointment in love.

Occasionally it may be impossible to assign any satisfactory reason for amenorrhœa, as in the following case:—

On May 19 I attended a lady in her third confinement, which was in every way perfectly normal. She suckled the baby till August 1, and then weaned it. She did not "see anything" while nursing, but she was surprised, and somewhat alarmed, to find that menstruation did not reappear after the child was weaned. Her general health was quite good, except for some feeling of "blood to the head" and flushing. September, October, and November passed by without menstruation having occurred, and she came to see me on December 3 with a view to ascertain whether she was pregnant. On examination I found that the uterus was not enlarged. On December 17 I heard from her that menstruation had at last reappeared. The only apparent explanation of the amenorrhœa was that she was staying in the country most of the time; but, on the other hand, this appears to have been her usual custom during that part of the year. Menstruation in this case was rather late in starting; it began between sixteen and seventeen, but she was not really regular till she was twenty-one.

4. *Primary amenorrhœa may be due to congenital defects of the generative organs.* Such as the following:—

(*a*) There may be no uterus, or only a rudimentary uterus, the ovaries being normal.

(*b*) The ovaries may be absent or rudimentary, the uterus being normal.

(*c*) The infantile condition of uterus and ovaries may persist throughout life.

(*d*) The ovary and other appendages of one side may be absent.

5. *Local morbid conditions causing, or associated with, amenorrhœa.* Such are:—

(*a*) *Ovarian tumours;* sometimes, however, there is menorrhagia in such cases.

(*b*) *Pelvic inflammation* (Perimetritis, Parametritis), especially when ending in abscess. The amenorrhœa is partly, no doubt, due to the depression of the general health. Sometimes, however, there are menorrhagia and metrorrhagia in cases of pelvic inflammation.

(*c*) *Exposure to cold during menstruation* is very apt to be followed by pelvic peritonitis and amenorrhœa; cold may stop the flow, even if pelvic inflammation does not occur.

(*d*) *Superinvolution of the uterus.*

(*e*) A large solitary subperitoneal fibroid tumour of the uterus (other varieties of fibroid tumour being absent) is sometimes associated with amenorrhœa, and apparently the cause of it. I have seen several cases of this kind.

6. *Lastly, amenorrhœa is physiological during pregnancy, and while suckling.* When a healthy-looking girl complains of amenorrhœa, *having been quite regular up to the time of the last menstruation*, there is considerable probability that the cause of the amenorrhœa may be a physiological one.

Treatment.—A. *In cases of sudden suppression* by exposure to cold during, or just before, menstruation, the patient should have a hot hip-bath with mustard in it, and be put to bed, lying between the blankets. A glass of gin, or whisky in hot water, will be useful as a diaphoretic.

If there is much pain, a morphia suppository (gr. ¼) may be ordered. Sudden suppression of menstruation by exposure to cold predisposes the patient to an attack of

pelvic peritonitis, and she should be kept in bed for some days as a precaution, even if no symptoms of peritonitis arise.

When the time comes round at which the next menstruation should appear, the patient should have a hot mustard-and-water hip-bath for three or four nights running before the day on which the period is due; if this does not bring it on, three or four leeches may be applied round the anus, or to the inside of the thighs.

In between the dates when the periods are due, attention should be directed to the general health; and in most cases a mixture containing small doses of saline purgatives will be useful, such as the following:—

℞ Mag. Sulph., ℈j.
Sod. Bicarb., gr. xv.
Sp. Chlor., ♏v.
Infus. Gent. Co. ad ℥j.

twice or three times a day, according to the effect produced on the bowels.

B. *In cases of chronic amenorrhœa associated with anæmia*, whether the anæmia has preceded and brought about the amenorrhœa, or whether we have reason to think that ovarian inactivity, by failing to stimulate nutrition, has led to the anæmia, the main thing is to improve the general health.

Out-door exercise, cold baths, regular hours, and a sufficiency of food are of great value.

As regards medicine, if the tongue is furred, some such prescription as that given above is suitable to begin with; and as there is nearly always obstinate constipation, it should include a sufficient dose (for example, a drachm) of sulphate of magnesia, to make the bowels act regularly.

If, however, the tongue is clean, we may at once prescribe iron, and it is best to try a mild preparation at first, such as the ammonio-citrate. If this is well borne, we may soon change it for the astringent preparations of iron, which are by far the best for anæmia as soon as the stomach can bear them.

Such are the sulphate of iron, and the liquor ferri perchloridi.

The sulphate is best given in the form of pill, combined with a small quantity of watery extract of aloes.

℞ Ferri Sulph. Exsicc., gr. ij.
Ext. Aloes Aq., gr. ¼.
M. ft. pil. j., thrice daily after meals.

Or, if we wish to give the liquor ferri perchlor., a suitable combination is:—

℞ Liq. Ferri Perchlor., ♏xx.
Tr. Nuc. Vom., ♏iij.
Mag. Sulph., ℈j.
Sp. Chlor., ♏v.
Aq. ad ℥j.
Thrice daily after food.

Occasionally, where iron does not effect our purpose, small doses of arsenic are useful, such as one or two drops of the liquor arsenicalis, three times a day, after food. Levico water, which contains arsenic, is also useful in the same way. The peroxide of manganese in two-grain tabloids, one to four after meals, is also useful. The cases, however, in which iron fails are not many, especially after preliminary treatment with saline purgatives. It would seem to follow, from Dr. Blair Bell's researches referred to above, that the administration of calcium salts is indicated in some cases of amenorrhœa. When, therefore, the other drugs mentioned have not proved successful, calcium lactate may be tried.

In some cases I have found thyroid gland, gr. ½, in tabloid t.d.s. for ten days at a time, followed by the return of menstruation. In one case recently this succeeded after a long course of calcium lactate without result.

C. *Where amenorrhœa is only a minor symptom in the course of grave organic disease, such as phthisis, it of course requires no special treatment.*

D. In cases where there is no constitutional condition discoverable to account for the amenorrhœa, and where no local morbid condition, other than that the uterus is smaller than it should be, can be detected, it has been recommended that we should resort to local treatment. The local treatment referred to is the dilatation of the cervical canal by a series of bougies, as hereafter described under dysmenorrhœa, or

the introduction of a stem pessary into the uterus, the stem being formed partly of zinc and partly of copper—the galvanic intra-uterine stem pessary. It is easy of course to make the inner surface of the uterus bleed by mechanical irritation, such as treatment of this kind necessarily involves. Menstruation is, however, a very complex process, of which external hæmorrhage is only one of the symptoms. Making the endometrium bleed produces one of the symptoms, but it is a long way from producing the process. Cases of primary amenorrhœa associated with a congenitally small uterus had better be left entirely without local interference.

In cases where the amenorrhœa is not primary, and where there is no obvious abnormality to explain it, the administration of permanganate of potassium—gr. i.-ij. in tabloid three times a day—may be successful.

The tabloid should be dissolved in water and taken after meals. Half a tumbler of water should be taken after each dose.

Thyroid gland and calcium lactate may also be tried.

CHAPTER III.

BLEEDING.

ONE of the symptoms most commonly met with in organic disease of the pelvic organs is bleeding—using the term to mean bleeding other than that occurring in normal menstruation.

Excessive loss of blood at the menstrual periods is known as *menorrhagia*. Bleeding occurring between the menstrual periods, or not distinctly associated with menstruation, is known as *metrorrhagia*. Clinically, however, these distinctions cannot always be made; practically what we must take account of is, whether the patient is losing too much blood—either because her periods recur too often, for example every fortnight, or because, although the periods do not recur too often, she loses an excessive amount each time; further, these conditions may be combined—the patient menstruating too often, and losing too much blood on each occasion.

Finally, bleeding may occur in the intervals between the periods.

CLASSIFICATION OF THE COMMON CAUSES OF BLEEDING.

I. Bleeding in connection with pregnancy.

Abortion, or miscarriage—threatened, or inevitable.

Incomplete abortion, or miscarriage—portions of the ovum being retained, and causing bleeding.

Missed abortion, or miscarriage.

(*Note.*—When the fœtus dies in the earlier, or middle periods of pregnancy, the ovum is usually expelled at no long interval after; exceptionally the ovum is retained in utero for a considerable time *after* the death of the fœtus, and during that time the patient is in a state of "missed

abortion" or "miscarriage," according to the period to which pregnancy had advanced when the fœtus died—*abortion* being the term used to denote expulsion of the ovum up to the end of the third month—*miscarriage*, its expulsion from the end of the third month to the end of the seventh lunar month—the twenty-eighth week.)

Subinvolution of the uterus.

Placenta prævia.

Accidental hæmorrhage, i.e., hæmorrhage from the detachment of a normally situated placenta.

Post-partum hæmorrhage. Primary. Secondary.

Extra-uterine pregnancy.

Malignant disease of the cervix complicating pregnancy.

Rupture of varicose veins of the vulva, or vagina, during pregnancy.

Molar pregnancy.

Placental polypus.

Fibrinous polypus.

II. **Bleeding not distinctly connected with pregnancy or labour.**—Common causes of this are :—

Malignant disease of the cervix uteri.

Fibroid tumours and fibroid polypi of the uterus.

Mucous polypi of the uterus.

The age of puberty, and of the menopause.

Ovarian tumours.

Over-lactation.

The stimulus of recent marriage causing congestion of the pelvic organs.

Pelvic inflammation, in some cases.

Slight bleeding, or a discharge sometimes blood stained, may be due to :—

Foreign bodies in the vagina (ill-fitting pessaries, hair-pins, pieces of sponge, &c.).

Prolapse of uterus (from ulcers of the inverted vagina).

Vascular caruncle of the urethra.

Less common causes of bleeding are :—

Malignant disease of the body of the uterus.

Malignant disease of the vagina, or of the external parts.

Diseases of the liver and heart causing venous congestion.

Endometritis of the body of the uterus.

Inversion of the uterus.
The hæmorrhagic diathesis.
Laceration of the hymen at the first coitus.

I. Bleeding in Connection with Pregnancy.

Clinically one of the most important facts to grasp is that, in spite of menstruation occurring regularly, or rather in spite of the fact that the patient has bleeding recurring about every month, which she takes for menstruation, she may nevertheless be pregnant—perhaps as much as five or six months, as in the following case :—

C. P., aged 37, married eighteen years, three children, the last nine years ago, seven miscarriages, the last a year and a half ago at the end of the third month, was admitted into the London Hospital, complaining of bleeding for the last six weeks. Every day of the last six weeks she had lost something, and more the last three weeks than before. *She had been regular up to the commencement of the bleeding*, which began at one of her periods. On examination, a uniform elastic swelling was found rising out of the pelvis, and reaching up to the umbilicus. A souffle could be heard to the right of the tumour, but no fœtal heart-sounds. The patient did not think she was pregnant. Vaginal examination found the cervix softened, and blood escaping from the os uteri. The bimanual examination showed that the swelling in the abdomen was connected with the uterus—in fact, felt like the pregnant uterus. The sound was passed six inches, with the intention of emptying the uterus (this was justifiable, because the patient had been losing blood for six weeks, and in considerable quantities for three weeks). Forty-eight hours later, as no progress had been made, and the patient was still losing, the membranes were ruptured with the sound. Six hours after, the patient miscarried. The fœtus was of about five months' development.

This case, not by any means an uncommon one, shows the necessity of keeping the possibility of pregnancy in mind, although the patient believes herself to have been menstruating regularly, and has no suspicion that she is pregnant.

Incomplete abortion.—The next case illustrates bleeding due to an incomplete abortion, parts of the ovum having been left behind.

E. G., aged 39, married sixteen years, seven children, came to the London Hospital complaining of losing a large quantity of blood from time to time, ever since she had had a miscarriage five months previously.

She was three months pregnant when the miscarriage occurred. For some weeks before admission she had been losing blood three or four days out of every week.

Examination showed that the uterus was somewhat large; the sound passed 3½ inches. Some blood was escaping from the os uteri. Under ether, the cervix was rapidly dilated by means of Hegar's dilators (a method that has been already described, see p. 35), and the finger passed into the uterus. Several irregular prominences were felt scattered over the mucous membrane of the uterus, varying in size from that of a split pea up to that of half a cherry. They were scraped away as completely as possible, chiefly with the finger-nail. Pure carbolic acid was applied to the interior of the uterus. The little masses removed looked like pieces of placenta that had retained their vitality. After their removal the patient menstruated regularly, and not excessively.

Placenta prævia.—Bleeding due to placenta prævia usually occurs at an advanced period of pregnancy, when the fact of pregnancy existing is unlikely to be overlooked. Exceptionally, and this is especially likely where the case is one of central placenta prævia, bleeding occurs comparatively early—as in the following case. Here the patient was unaware of the pregnancy.

Mrs. F., aged 37, married thirteen years, four children, the last five years old, no miscarriages, came to me on June 23, 1886, with the following history. She was regular till the first week in January, when her last proper menstrual period occurred.

At the beginning of February, just when she was expecting her period, she "caught a cold," and the period did not come on; she remained in bed, on and off, for two or three weeks. Early in March she had a hæmorrhage lasting five weeks; after that she was a month free from bleeding. Then it came on again, and from that time till she came to me the bleeding continued more or less. Since February she had also suffered from attacks of pain across the lower part of the abdomen. On examination the uterus was found reaching up to the umbilicus; bleeding was still going on in small quantity. The patient was anæmic; and, having regard to the time bleeding had been in progress, I had no hesitation in advising her to have the cervix dilated. Under an anæsthetic I accordingly dilated the cervix with Hegar's dilators. As soon as I could get my finger in, I felt the placenta over the os; I detached it all round, ruptured the membranes, brought a leg down, and completed delivery. The uterus was washed out afterwards with iodine water, and vaginal douches of the same were used twice a day for a week after. The patient made an uninterrupted recovery.

Extra-uterine gestation.—Bleeding in connection with extra-uterine gestation is marked rather by *irregularity* than

by profuseness. A common history in cases of tubal gestation (the commonest variety of extra-uterine gestation) is that the patient misses a period, and goes two or three weeks over her time; then a hæmorrhage comes on, during which a decidual cast of the uterine cavity may be passed.

The actual amount of blood lost externally is usually slight, but the loss tends to be persistent; very often the discharge is of a dark brown or brownish-black colour; so often indeed that this colour may be regarded as somewhat characteristic of the condition.

While missing a period—a slight interval of amenorrhœa—followed by a persistent hæmorrhagic discharge is the history most frequently given in cases of early extra-uterine pregnancy, we often find that, on the other hand, the patient gives a history *of a period having come on sooner than it should have done*, for instance only ten days or a fortnight after the preceding one.

If the patient had also had attacks of pain in one or other iliac region, the presumption in favour of the case being one of extra-uterine pregnancy would be strengthened; and some approach to certainty in the diagnosis would be reached if the physical examination discovered a tense, elastic, more or less fixed swelling at one side of the uterus, the size of a hen's egg. It should be mentioned that occasionally, as quite a rare exception, a case of extra-uterine pregnancy may be attended, like ordinary pregnancy, by amenorrhœa, up to the crisis of tubal abortion, or tubal rupture. For instance, in a case of interstitial gestation that came under my care at the Hospital, the patient thought she was five months advanced in an ordinary pregnancy, and had "seen nothing" for five months. Then rupture of the sac occurred with a fatal result.

Malignant disease of the cervix complicating pregnancy.—It is important to bear in mind the not infrequent association of these conditions. Otherwise, during the early months, the pregnancy is very likely to be overlooked. When a woman with malignant disease of the cervix says she has been bleeding for more than twelve months (as in a case which I remember where the patient was four months pregnant), one is apt to forget that she may be pregnant. A careful

bimanual estimation of the size of the uterus as a routine method, in every case where any vaginal examination is made at all, is the best safeguard against overlooking early pregnancy, in this and other cases.

Molar pregnancy.—There are two varieties of mole:

1. The vesicular or hydatidiform mole.
2. The blood mole, and its later stage—the fleshy mole.

1. *The vesicular mole.*—This is produced by a cystic degeneration of the chorion villi. Among the symptoms it gives rise to is bleeding. The patient has a red discharge. It is sometimes said that there are white cysts in it, varying in size from that of a grape downwards. The presence of these cysts would of course be pathognomonic, but though I have seen a large number of cases of vesicular mole, I have never seen one in which there were cysts in the discharge till the mole was in process of being expelled. Another point to which attention must be paid is, that the uterus is generally larger than would correspond to the supposed month of pregnancy. I have seen, however, one well-marked exception in this respect.

Apart from the occurrence of bleeding and the presence of characteristic cysts, however, in any particular case where the size of the uterus on examination is greater than corresponds to the period of pregnancy, it is much more likely that the patient is "out in her count," than that she has a vesicular mole.

Cases of hydatidiform mole may for clinical purposes be divided into two classes: (1) Where the case first comes under observation at a time when the diagnosis has yet to be made, where we can only have a strong suspicion as to the nature of the condition present; and

(2) Where the case is first seen when the os uteri is well dilated, and the mole is in process of being discharged. In such cases the diagnosis is of course obvious, and the treatment, if any is needed, merely consists in facilitating the expulsion of the mass. It is in the first group of cases that difficulty arises, and to arrive at a probable diagnosis requires a careful consideration of the history and physical signs present. The history is usually somewhat as follows:—In the first instance, the patient missed one, or perhaps two

periods, and in consequence believed herself to be pregnant; but this interval of amenorrhœa has been followed by irregular hæmorrhagic discharges. If she is observant, she may have noticed a rapid increase in the size of her abdomen. Usually this is all the history. No doubt it may happen that the characteristic cysts may be found in the vaginal discharge, and if this is so (and we see the cysts ourselves) there is an end of the difficulty. But much more frequently no cysts are observed in the discharge, either by the patient or by trained nurses who have been specially informed as to the importance of finding the cysts, or by ourselves when examining the patient. In other words, the only local symptom is, in most cases, the presence of a red vaginal discharge.

The physical signs may be described as those of pregnancy, except such as depend on the actual presence of the fœtus; that is to say, there are the usual changes in the breasts, and on examining the abdomen we find a uniform, elastic tumour, centrally situated, and rising out of the pelvis, over which, as a rule, a loud uterine souffle may be heard; but nothing like the parts of a fœtus can be felt on palpating the tumour, nor can the fœtal heart be heard even by repeated observations. It is of some value if the size of the tumour is much greater than would correspond to the supposed duration of the pregnancy. Per vaginam, similarly, we find the signs of pregnancy, except those that depend on the presence of the fœtus. So that we may have blueness of the vulva and vagina, softening of the cervix, the recognition that the tumour observed in the abdomen is the body of the uterus; but on the other hand, ballottement cannot be obtained, nor can anything like a part of a fœtus be felt through any of the vaginal fornices. As a rule, the speculum shows a reddish or brown discharge coming from the os uteri.

Given a case with the history and physical signs mentioned, a diagnosis of hydatidiform mole may be made with a considerable degree of confidence, and the right treatment is to empty the uterus. I have found the most satisfactory method of doing this is to dilate the cervix with Hegar's dilators till the os will admit the finger, and then to remove the mole, partly with the fingers and partly with polypus forceps. The uterus is then washed out with hot iodine water

through a double-channelled intra-uterine tube, and the operation is at an end. Antiseptic vaginal douches are given for a few days subsequently.

As regards the three cases, notes of which follow, in the first the mole was discharged spontaneously; in the second the uterus showed no tendency to empty itself, although the patient was kept under observation in the Hospital for nearly a month before any operative treatment was adopted. In this case the continuance of the hæmorrhage furnished the chief indication for interference. In the third case the cervix was dilated, and the uterus emptied two days after the patient was first seen. Here the indications for immediate treatment were: (1) the great size of the uterus, which was as large as the pregnant uterus between the seventh and eighth months; (2) the fact that the patient had been suffering for about three weeks from obstinate vomiting, and had been rapidly losing flesh. This third case is also remarkable in that the patient had had no children (and indeed had only been married seven months), whereas hydatidiform mole most frequently occurs in those who have had children.

(*Note.*—In a minority of cases, where the cystic change has only affected a relatively small portion of the chorion, a fœtus may be present with the hydatidiform mole.)

Illustrative Cases.

1. E. R., aged 27, married ten years, three children, the last one year and nine months old, no miscarriages, was admitted into the London Hospital on December 7, 1887.

History of the present illness.—On admission she said that she believed herself to be between three and four months pregnant. At the time when, according to her calculation, she would have been two and a half months pregnant, bleeding came on, and sickness, which she had been suffering from previously, became more troublesome. She went to a doctor, who gave her some medicine, after taking which the bleeding and sickness stopped. At this time also she felt something move inside her, falling to the lower part, and causing her much discomfort in walking.

December 8.—On examination the uterus was found reaching to within a finger's breadth of the umbilicus; there was some brownish discharge in the vagina, but no recent blood. The cervix was apparently shortened, but was not very soft.

Menstrual history.—Before the present illness she was regular every four weeks; for the last three or four months she had not menstruated

properly, but had had occasional slight bleeding, lasting sometimes an hour and a half; the bleeding in question was accompanied by pain in the abdomen.

On admission she was given Ext. Ergot. Liq. ♏x. and Pot. Brom ℈j. three times a day.

January 4, 1888.—She has had slight bleeding and pain from time to time since the last note. The uterus is within an inch of the umbilicus. The last two or three days the loss of blood has increased in quantity.

On the evening of the 4th, between 6 and 7 p.m., pains like labour pains were felt; they increased in force till midnight, when a hydatidiform mole was passed. The mass was the size of the placenta at full term. No trace of a fœtus could be found. The patient made an uninterrupted recovery.

2. S. C. P., aged 22, married four years, two children, the last born in January, 1887, one miscarriage three months after marriage, was admitted into the London Hospital on August 8, 1888.

History of the present illness.—She had not been properly "poorly" for four months, but for the last six weeks she had had a red discharge; she only noticed the swelling in her abdomen three weeks ago. She had had pain in the lumbar region and both iliac regions, worse on the right side. Three months ago she began to suffer from morning sickness. On July 30 she felt something move in the tumour, and continued to do so for four days; since then no movement had been felt. Patient suckled her second child up to March last (fourteen months).

Menstrual history.—The catamenia appeared at fourteen, and she had been regular every four weeks; no pain at the time.

Present state, August 13.—Patient is slightly anæmic. Temperature 99°; pulse 98, small and weak. A centrally situated swelling is felt in the abdomen, rising out of the pelvis, and reaching up to the umbilicus. The tumour is felt to harden, and again to become softer, alternately. A loud uterine souffle is heard over the tumour, but no fœtal heart sounds.

Vaginal examination.—The vaginal mucous membrane is only slightly blue, the cervix is soft, and the os not patulous; the cervix is blue, there is no blood seen about the os to-day, though on examination on August 11 some was seen.

August 23.—The patient has had a red discharge continuously since the date of the last note. The loss has been more abundant at night.

She has felt no movement in the tumour.

No fœtal heart sounds to be heard.

The tumour (measured with the tape) reaches a height of 6¾ inches above the pubes.

On vaginal examination no blood is found, nor is the os patulous.

September 1.—Daily red discharge has continued, and last night a good deal of blood was lost.

September 3.—Discharge has continued as before. Patient is now decidedly anæmic. The tumour (measured with the tape) now rises 8 inches above the pubes. Nothing but a loud souffle to be heard over it.

On vaginal examination some blood-stained mucus is seen in the os uteri.

On account of the continuous loss of blood, which had now rendered the patient markedly anæmic, it was decided to dilate the cervix.

Accordingly chloroform was given, and I dilated the cervix with Hegar's dilators, beginning with No. 13 and continuing up to No. 28 (the first of a larger series specially made for me). As soon as the finger could be passed in, this was done; some partially decolorized clot came away, and some portion of a vesicular mole as the finger was withdrawn. It was now of course decided to empty the uterus completely. This was done by passing two fingers of the right hand into the uterus, and pressing down the uterus from the outside with the left hand. Ovum forceps and Récamier's curette were also used in getting the mole away. The whole mass in a graduated glass measured 30 ounces. The cavity of the uterus was washed out with iodine water, and then the endometrium was swabbed with pure Tr. Iodi; a hypodermic injection of ergotin was also given.

The uterus contained nothing but the hydatidiform mole; no trace of a fœtus could be found.

The patient did quite well, and went home on November 1, 1888.

3. Mrs. F., a young married lady, came under my observation on December 29, 1889. She had been married in May, 1889. The catamenia were regular every month up to the middle of September last; she then "saw nothing" for about three months, and thought she was pregnant. For about three weeks before I saw her she had been suffering from obstinate vomiting every day, and also for about the same time she had had a brownish-red discharge from the vagina. She was aware of the tumour present in the abdomen, and she was very positive that a month ago it was nothing like its present size. On examination there was a tumour in the abdomen reaching several inches above the umbilicus, and about the size of the pregnant uterus between the seventh and eighth months. It was centrally situated, freely fluctuating, and seemed to rise out of the pelvis. Nothing like any hard part of a fœtus was felt anywhere in the tumour. On auscultation I could hear nothing over the tumour; but as I had had half an hour's drive in an open trap, and there was a hard frost at the time, I think it quite possible that a souffle might have been heard under more favourable conditions. A catheter was passed, but only about an ounce of urine was drawn off. On vaginal examination the cervix was typically soft; it was blue, and there was some reddish-brown discharge coming from it. The anterior vaginal fornix was bulged down by a convex elastic swelling, apparently continuous with the cervix. Nothing hard like a part of a fœtus was felt anywhere in the swelling. The breasts had the appearance characteristic of pregnancy at three or four months, and contained a little secretion. I had no doubt the patient was pregnant, and that there was some pathological condition of the ovum as indicated by the persistence of a red discharge from the uterus. It seemed to me that it was either a case of hydatidiform mole, and that the whole tumour was the uterus containing it; or, that it might perhaps be

case of threatened miscarriage at about the third or fourth month, complicated by the presence of an ovarian tumour. I certainly thought the balance of probability in favour of vesicular mole. Under the circumstances the best course seemed to be to empty the uterus. Accordingly, on December 31, the patient was put under the influence of the A.C.E. mixture, and I dilated the cervix with Hegar's dilators till I could pass my finger into the uterus. On withdrawing the finger a fragment of a hydatidiform mole, showing the characteristic vesicles, came away with it. The diagnosis being settled, I proceeded to empty the uterus, using my fingers and from time to time the ovum forceps. The earlier part of the operation was the more difficult, because, owing to the great size of the uterus, the ovum forceps had to be passed in deeply. There were two or three sharp attacks of hæmorrhage at this time. It was checked by injecting hot iodine water into the uterus, but it could not, of course, be completely stopped till the uterus was empty, and able to contract down. The removal of the mole was therefore hastened as much as possible, the uterus ultimately contracting well, and the hæmorrhage then ceased. I carefully scraped the endometrium with Récamier's curette, and once more washed out the uterus with iodine water. The whole operation lasted about an hour. No trace of a fœtus was found; the cavity of the uterus contained nothing but the mole. I have since heard from the patient's medical attendant that she made an uninterrupted recovery.

(*Note.*—Not very long afterwards this patient became pregnant again, and was delivered at full term of a healthy child.)

I may add, as an example of pregnancy at an advanced age, that I saw a case of hydatidiform mole, with Dr. F. M. Corner, of Poplar, in a patient who was in her fifty-third year. Also in 1902 I saw a patient, aged 54, who had a hydatidiform mole.

2. *The blood-mole and fleshy mole.*—These are produced by blood finding its way between the layers of the membranes of the ovum—between the vera and reflexa, or the reflexa and chorion, or between the chorion and amnion. If the mole is expelled while the blood-clot is comparatively fresh, it is called a "*blood-mole.*" If not discharged till the blood-clot has become tough, and partially decolorized, it is called a "*fleshy mole.*"

A fleshy mole is usually about the size of an orange, and similar to it in shape; on bisecting it, it is found to have a central cavity lined by the amnion; this is raised up into irregular projections by the clot underneath. The fœtus may either have disappeared, or be recognizable as a little body an inch or less long, attached by a short stalk (the

umbilical cord) to some part of the amniotic surface. The wall of the mole may be an inch thick, and is made up of the layers of the membranes with blood-clot, more or less altered, between them.

It is not always that a mole in utero gives rise to hæmorrhage spread over any considerable period. I remember a case where a patient had not menstruated for seven months, and she thought she must be seven months pregnant. She had had some yellow discharge for two months. On examination the uterus was found to be of the size corresponding to the beginning of the fourth month of pregnancy. A few weeks later she passed a fleshy mole the size of an orange; its expulsion was only preceded by bleeding for a few hours, as in an ordinary abortion. Not infrequently, however, the presence of a mole gives rise to irregular hæmorrhages; and if the mole is decomposing, the discharge will be offensive. A mole is rarely retained beyond the time that would have been full term if the pregnancy had been normal.

Now as to diagnosis: whereas in the vesicular mole the size of the uterus is generally greater than corresponds to the supposed period of pregnancy, in the case of the fleshy mole the size of the uterus is less, as in the case just recorded, where a woman who thought she was seven months pregnant had a uterus only the size corresponding to the fourth month. Again, examining such a case at intervals, *e.g.* every fortnight, for a few weeks would show that the size of the uterus was stationary.

Placental polypus.—Bleeding dating from a particular confinement may be due to some portion of the placenta having been retained, the normal involution of the uterus being thereby interfered with. Layers of fibrin are deposited on the portion of placenta retained, and ultimately a sort of polypus is formed, which on examination is often to be felt presenting at the os uteri. The polypus is sometimes called also "*fibrinous*" polypus, but, occasionally, a fibrinous polypus may originate apart from pregnancy. I have known it develop on the slightly irregular surface left in utero after the removal of a fibroid polypus.

II. Bleeding not distinctly connected with Pregnancy or Labour.

Malignant disease of the cervix uteri.—One of the commonest causes of bleeding in this category is malignant disease of the cervix uteri; in these cases careful enquiry will usually elicit that, besides periodical excessive losses, there has been also a more or less constant discharge stained with blood between the periodical losses. The patient rarely goes many days without seeing some blood in the vaginal discharge.

Bleeding occurring some years after the menopause is, in a very large proportion of cases, due to malignant disease.

Fibroid tumours and fibroid polypi.—These are another common cause of excessive bleeding; the interstitial and submucous fibroids and fibroid polypi producing the most bleeding, and the subperitoneal the least, often none at all. Fibroid tumours range from the size of a pea up to masses weighing several pounds, as large as, or larger than, the pregnant uterus at term. A common size for fibroid polypi is that of a hen's egg, or an orange; they may, however, be much larger, or much smaller.

Mucous polypi grow from the mucous membrane of the cervix or body of the uterus. They are much smaller than fibroid polypi; a maximum size for a mucous polypus would be that of a large strawberry; an average one is the size of a small raisin, and similar to it in shape.

Menorrhagia of puberty and of the menopause.—The time when the menstrual function is being established (puberty), and the time when the menstrual function is about to cease altogether, are both periods when excessive losses of blood are common, apart from any discoverable organic disease, local or general.

Vascular caruncle of the urethra.—This is another common cause of slight losses of blood at irregular times. Another much rarer disease of the urethra, malignant disease beginning round the orifice of the urethra, is also a cause of slight bleeding. If the patient happen also to have a

yellow or white vaginal discharge, her account of it will be that there are streaks of red in the discharge from time to time.

Foreign bodies in the vagina (pessaries, pieces of sponge, hair pins, etc.) may cause a more or less red (and generally a more or less offensive) vaginal discharge. The bleeding in these cases is due to ulceration of the vaginal mucous membrane, caused by the pressure or irritation of the foreign body.

Excessive and irregular losses soon after marriage are not uncommon. The patient usually becomes regular spontaneously, as she becomes more accustomed to married life.

Over-lactation is another cause of excessive bleeding.

Hæmorrhage due to general venous congestion from disease of the heart, or liver.—It is only very rarely that uterine hæmorrhage can be satisfactorily traced to such causes.

Ovarian tumours.—More commonly the disturbance of menstruation caused by the development of ovarian tumours is in the direction of amenorrhœa, the intervals between the periods being lengthened, and the loss on each occasion becoming more scanty than before. Exceptionally, the growth of an ovarian tumour is attended with menorrhagia, or metrorrhagia.*

Endometritis of the body of the uterus.—This is another cause of excessive loss of blood. But it is not easy, except in the case of villous endometritis, to be certain of its presence in actual practice. Points to be attended to as presumably indicating endometritis of the body of the uterus are, slight increase of the size of the body ascertained on bimanual examination, tenderness of the body, and great tenderness on passing the sound. There may be a yellow discharge from the os uteri; but this, of course, is also found in inflammation limited to the cervical mucous membrane, a far commoner affection.

It is not to be thought that endometritis of the body of the uterus is not a real disease; what is meant is, that in actual clinical work it is comparatively rare to be able to

* A short paper by the author, "On the Occurrence of Metrorrhagia after the Menopause in Cases of Ovarian Tumour," will be found in the *Lancet* of January 2, 1897.

isolate it as *the* cause of the patient's symptoms. A villous condition of the mucous membrane of the body of the uterus has been termed *villous endometritis*; this variety is especially likely to be a cause of bleeding, and can be recognised clinically after dilating the cervix.

Laceration of the hymen at the first coitus.—This laceration, as a rule, only causes very trifling bleeding: exceptionally, it may cause severe hæmorrhage; of this I have seen a well marked example:—

Y. S., a German Jewess, aged 20, was admitted into the London Hospital on the afternoon of August 20, 1889, on account of hæmorrhage. She had been married the previous day. As a result of coitus severe bleeding came on, and, as it continued, the woman was brought to the Hospital. I saw her at once, as I happened to be in the Hospital at the time. She was deathly pale, and there was a great deal of recent blood on her clothes. Some blood was still coming from the parts, but she was so nervous that I could not examine her without an anæsthetic. She was therefore put under the influence of ether, and a hot vaginal douche having been given, the parts were carefully examined. There was a deep tear of the hymen posteriorly, but bleeding had stopped; probably the hot douche just given had stopped it. No blood was coming from the os uteri, nor was there any laceration of the vagina. As a precaution the vagina was packed with carbolic gauze, and a T bandage put on. The gauze was taken out next day, and the patient went home on the 23rd, there having been no recurrence of the bleeding.

Differential Diagnosis of the Various Affections Causing Bleeding.

Here only some remarks will be made on the general principles to be followed in forming an opinion in such cases.

In the first place, *always examine the abdomen*, in these as in all other gynæcological cases. If any tumour exist there, keep the possibility of pregnancy in mind, manipulate and ascertain if it feels like the pregnant uterus, particularly noticing if the tumour hardens during manipulation. Listen over it at various parts, and determine whether the uterine souffle, or the fœtal heart sounds, can be heard at any part of it, or not. Observe the condition of the external genitals, whether congested, bluish, and very moist as in pregnancy,

or not; on vaginal examination, notice whether the cervix is hard or soft, and above all carefully employ the bimanual method of examination to ascertain the size, shape, and consistence of the body of the uterus. In fact, in all cases in the first instance, consider the question of pregnancy, and endeavour to accumulate proof either of its presence or absence; the latter conclusion will only be justified if you are certain that the uterus, as estimated bimanually, is not the least bit increased in size.

If pregnancy has been excluded, consider the various causes of bleeding *not distinctly connected with pregnancy* given above. Some of them are diagnosed by inspection, *e.g.*, vascular caruncle, or malignant disease of the external parts; others, such as foreign bodies or polypi in the vagina, are detected at once by the examining finger, as also is malignant disease of the cervix uteri, if at all advanced.

The bimanual exploration of the regions at the sides of the uterus will show whether small ovarian tumours, or swellings, due to inflammation of the uterine appendages, are present. The speculum will aid in settling whether the bleeding be due to some condition of the vaginal portion of the cervix—as, for instance, malignant disease of the cervix in an early stage, and affecting the region round the os uteri. If neither inspection of the external parts, nor the vaginal examination, nor the bimanual examination, discovers any sufficient cause for the bleeding, it will remain for consideration whether the cause is some condition in the cavity of the uterus itself; this can only be positively ascertained by dilating the cervix and exploring the cavity of the uterus with the finger. The age of the patient should also be considered, for if no local condition to account for the bleeding has been discovered, it may be accounted for by the approach of the menopause.

It need hardly be said that in young, unmarried women, if nothing is found on examination of the abdomen, medicinal treatment should be fully tried before making any local examination.

Treatment.—From a consideration of the various causes of bleeding that have been enumerated, it will be evident that the treatment will depend on the cause. Here it is only

intended to mention the management of cases where, so far as can be ascertained, there is no local organic disease, and where consequently no *special* local treatment is required. The menorrhagia of puberty and of the menopause are examples of such cases.

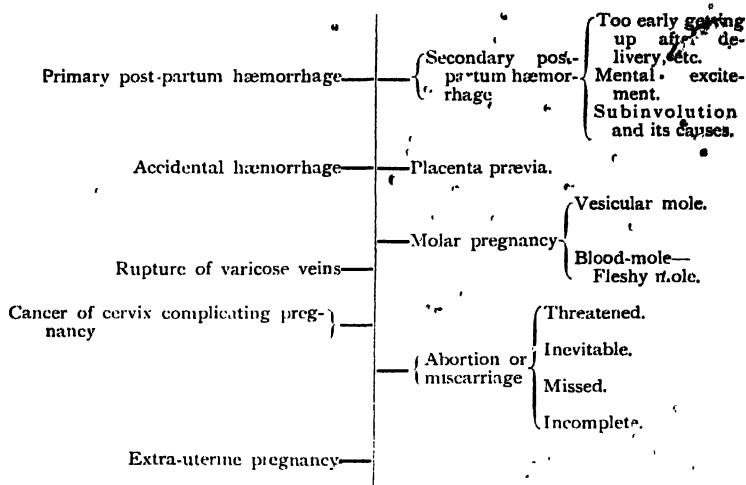
If the bleeding is at all considerable, rest in bed should be advised. Vaginal douches of hot water (as hot as the patient can bear it) should be given three or four times a day. For medicine, some preparation of ergot should be given; we may choose either ergotin (gr. ij.-v., in the form of pill, three times a day), or the ext. ergot. liq., B.P. (ʒss. three times a day). It is often beneficial to give bromide of potassium or ammonium in scruple doses as well, particularly in the menorrhagia of the menopause.

Other drugs from which benefit may be expected are tincture of hydrastis canadensis (♏xxx. t.d.s.); tincture of nux vomica, quinine, tincture of hamamelis (♏xxx. t.d.s.); and styptol, one or two tabloids, t.d.s.

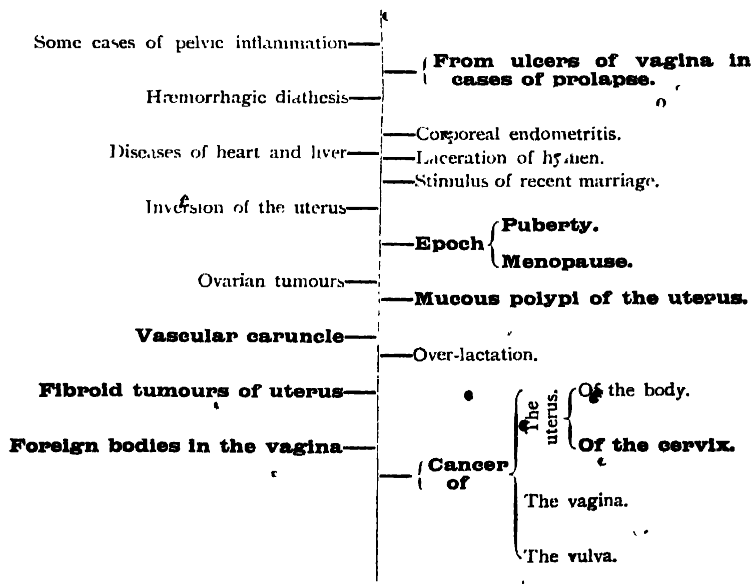
Calcium lactate is also recommended by Dr. Blair Bell.

If the hæmorrhage is alarming, and the cervix sufficiently patent to allow of the proceeding, the cavity of the uterus may be plugged with a long narrow strip of plain sterilized gauze. To do this properly the cervix is exposed with Sims' speculum, and its anterior lip seized with a volsella; the gauze is then to be packed in by means of uterine forceps, or Récamier's curette. Should there be a difficulty in doing this owing to narrowness of the cervical canal, a few sizes of Hegar's dilators, say up to No. 7 or 8, may be first passed. We are of course supposing the hæmorrhage to be really serious. The plug is, however, only a temporary measure, and is not to be left in more than twenty-four hours.* Thorough exploration of the endometrium should be insisted on subsequently.

* It is only very rarely necessary to insert a plug of gauze into the uterine cavity. When this has been done, care should be taken that the gauze is completely removed when the plug is withdrawn. I have known a case where such a plug was left in seven weeks; it was only discovered by the patient seeking advice on account of an offensive discharge. On examination a very foul piece of gauze was seen projecting from the cervix into the vagina. The upper part of the gauze was pretty firmly fixed in the cervical canal.



HÆMORRHAGES CONNECTED WITH PREGNANCY.



HÆMORRHAGES NOT CONNECTED WITH PREGNANCY.

CHAPTER IV.

DYSMENORRHŒA.

THE patient complains of pain occurring in association with her menstrual periods. The pain may begin a few days before the period, or may only occur during the flow, or even only occur after the cessation of the flow. Usually the pain is not so distinctly limited as to occur only *before*, *during*, or *after* the flow. Enquiry should be made as to when the pain is at its worse.

The pain complained of in cases of dysmenorrhœa may be referred to the lower abdomen, right across, or more especially to the region of the uterus, when it is generally paroxysmal in character, or to one or other ovarian region. There is also often pain in the lower part of the back about the sacro-lumbar articulation. Pain is also referred to the thighs, the inner aspect generally, and extending as low as the knees. Again not unfrequently there may be pain and tenderness in the breasts.

Clinically, cases of dysmenorrhœa may be divided into three groups:—

I. *Cases where a careful local examination discovers no abnormality whatever in the uterus or its appendages, and where also there is no gross abnormality in the process of menstruation itself, such as the passage of a cast of the uterus or of pieces of membrane.* The dysmenorrhœa in this group of cases is known as *spasmodic*, and also as *neuralgic* dysmenorrhœa.

II. *Cases where some abnormality is detected on physical examination.* This group includes, among others, the cases known as *inflammatory*, or *congestive*, dysmenorrhœa.

III. *Cases where some gross abnormality exists in the process of menstruation itself*, the only known instance of this being the passage of a membranous cast of the uterus, either in

one piece or broken up into several pieces—*membranous dysmenorrhœa*.

Diagnosis.—In considering into which group we must put any particular case of dysmenorrhœa, it will usually be easy to decide at once whether it belongs to Group III. or not—it is only important not to mistake a case of membranous dysmenorrhœa for an early abortion; the difficulty will be to decide whether it should go into Group I. or Group II.

If the most careful physical examination can detect no abnormality, the case must be classed in Group I. If, on the other hand, something abnormal is discovered, then the case goes into Group II. It will be evident that we cannot ever be *certain* that a case belongs to Group I.; the most we can confirm is that our examination discovers nothing abnormal. Physical examination, even in the most skilled hands, is far from enabling us to discover every morbid condition during life that an abdominal section or a *post-mortem* examination would detect. "Many cases have now been recorded where abdominal section showed the Fallopian tubes to be dilated with pus to the size of coils of small intestine, although the most careful bimanual had failed to detect their presence" (Hart and Barbour). And if so marked a degree of disease can escape detection by physical examination, we may be sure that morbid conditions of a less extensive character are frequently overlooked. Every candid operator will admit that, as regards abdominal operations, he has often found at the operation considerably more than his previous examination of the case had led him to expect.

Old adhesions, the remains of a previous attack of pelvic peritonitis, are especially to be thought of in connection with this point.

For the present we must be content to take it, that cases of dysmenorrhœa exist apart from any physical abnormality, but we ought to regard such cases with suspicion, remembering that physical abnormalities may be present, though we cannot discover them.

The chief abnormalities alluded to, which at once place the case in Group II., are:—

Imperfectly developed uterus.

Double uterus with atresia of one-half.

Interstitial inflammation of the uterus—metritis.

Pelvic inflammation (pelvic peritonitis and pelvic cellulitis), evidenced by feeling the mobility of the uterus impaired, perhaps so much so that the uterus is completely fixed, and by the presence of lumps in various parts of the pelvis; if at the sides, in the posterior quarters of the pelvis, such lumps are often really made up of distended Fallopian tubes, matted by adhesions to the ovaries and adjoining parts. This subject will be considered in detail under Pelvic Inflammation.

Fibroid tumours, an important cause of dysmenorrhœa from the age of 25 onwards up to the time of the menopause.

Ovarian tumours in some cases.

Retroflexion, or retroversion, with incarceration of the body of the uterus in Douglas' pouch.

CLINICAL FEATURES OF SPASMODIC DYSMENORRHŒA.

GROUP I.—In this group of cases the dysmenorrhœa is usually, but not always, *primary, i.e.*, it dates from the establishment of the function of menstruation. The pain is usually paroxysmal, and referred to the hypogastric region.

As a rule, the pain begins a few hours before the flow, and continues for the first day or two of the period. The time when the most severe pain is felt is during the first few hours while the flow is scanty. The flow then usually increases in quantity, and the pain diminishes, or ceases. The blood may contain clots. As time goes on the patient usually gets worse. Marriage tends to increase her trouble, unless pregnancy ensues; after which the dysmenorrhœa is often permanently cured. Many patients with spasmodic dysmenorrhœa are, however, unfortunately sterile. Retching or vomiting often occurs at the periods in cases of spasmodic dysmenorrhœa. These symptoms appear to be due to the severity of the pain.

It is often found that the severity of the symptoms—pain, retching, vomiting, etc.—varies greatly at different menstrual periods. Sometimes one or two periods may be passed through without the occurrence of any symptoms. This fact should

be remembered when estimating the effect of any particular treatment.

In many cases pain similar to that complained of at the periods may be produced at any time by passing the sound, and it occurs in typical cases just as the sound passes the internal os uteri. The pain is, however, only produced if the sound used is large enough to *stretch* the internal os uteri.

The pain in spasmodic dysmenorrhœa is certainly due to painful contraction of the uterus.

CLINICAL FEATURES OF INFLAMMATORY DYSMENORRHŒA

GROUP II.—So far as relates to the cases known as congestive or inflammatory dysmenorrhœa the affection is not primary, but dates from some well-recognized antecedent of pelvic inflammation, *e.g.*, labour or abortion. The pain is of a constant aching character, and precedes the flow, being relieved when this occurs, and especially is this so when the loss is free. The pain may begin a variable time before the period, days or even weeks, reaching its greatest intensity just before the flow. As to the causation of the pain, in these cases it should be remembered:—

1. That uterine contractions take place during the process of menstruation.

2. That at the menstrual period there is an afflux of blood to the reproductive organs, uterus and ovaries particularly, and that this afflux of blood causes these organs to be distinctly increased in size at this time.

Coming now to theory, it may be suggested that any condition which will prevent the uterus and ovaries readily accommodating this increased amount of blood sent to them, and any condition which will interfere with the alterations, in position and size, that the uterus undergoes during its contractions, will afford an intelligible explanation of the pain.

To take an example, if there is interstitial inflammation of the uterus (metritis), it may be taken that the excess of blood endeavouring to find its way into the vessels of the uterus at the menstrual period will be less readily accommodated than if the tissues of the uterus were healthy. The uterine tissue being in a state of disease cannot easily permit the increase of

size and change of shape needed to accommodate the excess of blood coming to it at the menstrual period. This view, so far as metritis is concerned, is not very different from the theory, modified from Fritsch, put forward by Hart and Barbour, viz., that the pain is due to the flushing of a diseased tissue with blood. But I think that we must not only regard interstitial changes in the uterus as offering resistance to the afflux of blood, and so accounting for the pain; conditions of equal importance outside the uterus, and affecting the ovaries and Fallopian tubes, also offer resistance to the afflux of blood, and take their share in producing pain. More particularly, adhesions between the uterus and adjoining parts, or between the ovaries and Fallopian tubes, require to be mentioned as causes acting in this direction. For the sake of argument take an extreme case, where there are dense adhesions, not only between the peritoneal coat of the uterus, the ovaries, and Fallopian tubes, but also running on to the walls of the pelvic cavity, matting the organs firmly together, and binding them also to the pelvic walls.

Imagine now that the vessels of the uterus and ovaries are suddenly called upon to accommodate a much larger quantity of blood than they have previously held. In order to do so the uterus and ovaries must swell up, so as to be obviously larger than before, and in doing so they will necessarily undergo some alteration in position, but the adhesions mentioned will prevent the changes taking place as they should do. The resistance offered to these changes of size and position, that the uterus and ovaries naturally ought to undergo at the menstrual period, may account for the pain.

Adhesions will also interfere with the contractions of the uterus that occur at the menstrual period, and some of the pain will be due to this interference. Similarly it is probable that interstitial inflammation of the uterus or ovaries by offering resistance to the menstrual afflux of blood will cause pain.

We may then state this theory in general terms as follows:—

Any condition, either in the tissues themselves of the uterus or ovaries, or external to them, which renders these organs

less able to undergo the changes of size, shape, and position, necessary to accommodate the increased supply of blood coming to them at the menstrual periods, will be a cause of dysmenorrhœa, as also will be any condition impeding the contractions of the uterus that occur at the periods.

Inflammation of the tissues of the uterus (metritis), and similar inflammation of the ovaries, will be conditions in the former category; pelvic peritonitis, producing adhesions in various parts of the pelvis, is the cause referred to as external to the uterus and ovaries. Either metritis or pelvic peritonitis, producing adhesions round the uterus, is likely also to impede the contractions of the uterus, and so in that way cause pain.

Clinically we often meet with cases of dysmenorrhœa dating from a particular confinement, previous to which there had been no pain at the menstrual periods. We usually find evidence of old pelvic inflammation in these cases thickening round the uterus, diminished mobility of the uterus, and so on. It is evident that such cases are explained by the theory just above referred to.

The presence of a growing fibroid tumour of the uterus, as is well known, is often associated with dysmenorrhœa; this might be explained partly on the view that the presence of a fibroid tumour in the wall of the uterus interferes with the uterine contractions, acting indeed somewhat like a foreign body, and partly on the view that a growing fibroid is the cause of an excess of blood, over and above what would normally come to the uterus at each period, coming to it, and that this excess cannot easily be accommodated, and hence we have pain.

When dysmenorrhœa commences in middle life the presence of a growing fibroid should be suspected. The following case is a good example of dysmenorrhœa due to fibroids:—

The patient, aged 46, had been married 21 years, and had had two children, the last 17½ years previous to my seeing her. Four and a half years ago (*i.e.*, when she was about 41) she began to suffer from severe pain at the periods. She had had no dysmenorrhœa previously.

She consulted the late Dr. Cullingworth at that time, and I saw his letter to the patient's doctor, from which it appeared that at that time nothing abnormal was to be detected in the condition of the uterus.

When I saw the patient the uterus was markedly enlarged, and the sound passed four inches. She suffered from profuse menorrhagia, as well as from very severe dysmenorrhœa.

Various alternative methods of treatment were put before the patient, but, as she had been ill so long, she determined to have the uterus removed. Accordingly I performed abdominal hysterectomy. On examining the uterus after removal, one submucous fibroid the size of a hen's egg was found projecting into the cavity of the uterus, and there were several interstitial fibroids in the walls of the uterus as well. She made a good recovery. The patient was sent to me by Dr. Baine, of Luton.

No doubt the onset of the dysmenorrhœa (4½ years before I saw her) indicated the time when the fibroids were beginning to grow; though at that time, as is proved by Dr. Cullingworth's examination, no physical signs of them could be detected.

CLINICAL FEATURES OF MEMBRANOUS DYSMENORRHŒA.

GROUP III.—Here the dysmenorrhœa is essentially primary, *i.e.* in the large majority of cases it begins at the time menstruation is established.

The pain begins just before, or at the beginning of, the flow, and is "colicky" or paroxysmal in character.

The flow is profuse, but in many cases diminishes in 24 to 36 hours, the pain becoming greater; then the membrane is passed, the pain is relieved, and the flow once more becomes free.

Cases in this group differ from cases of spasmodic dysmenorrhœa (Group I.) in that the flow is generally profuse and the pain is not relieved by the flow, but only by the passage of the membrane. The pain in cases of membranous dysmenorrhœa is probably not due to obstruction of the canal by the membrane. For at the beginning of the period there is the pain, but the canal is certainly not plugged then. Possibly plugging of the canal may be the reason why the pain becomes more intense in many cases at the end of 24 or 36 hours; but here again we have another factor to be considered, namely, the passage of a foreign body (the membrane) over a specially sensitive spot—the internal os uteri.

As has been said previously, in describing the process of

normal menstruation, no appreciable portion of the lining membrane of the uterus is normally shed. In order to account for the passage of a membrane in cases of membranous dysmenorrhœa, it may be supposed that for some reason or another, possibly as a result of inflammation, the epithelial lining of the uterus has become tougher than normal, and that therefore it will not give way at the various points superficial to the sub-epithelial blood lacunæ, which are formed during normal menstruation. The blood lacunæ therefore get larger and larger, and coalesce, and when the pressure of the underlying blood reaches a certain point, the whole lining of the body of the uterus is separated, and extruded.

A point of much practical importance is to distinguish cases of membranous dysmenorrhœa from cases of early abortion.

A case to be a genuine example of membranous dysmenorrhœa must be one in which a membrane is passed regularly at monthly intervals for a considerable time. Where a membrane is only passed occasionally with postponement of menstruation, the case is probably an instance of early abortion; and there is the same probability if a membrane is only passed when the patient is cohabiting with her husband, and if it ceases to be passed when marital relations are interrupted.

Anatomically the sac of an early abortion is ovoid and more vascular, the membrane of membranous dysmenorrhœa is more triangular and less vascular. In thickness menstrual membranes vary from $\frac{1}{25}$ to $\frac{1}{12}$ inch, rarely $\frac{1}{8}$ inch. Abortive deciduæ vary in thickness from $\frac{1}{5}$ to $\frac{2}{5}$ inch (Champneys).

The membrane passed in dysmenorrhœa, as a rule, corresponds only to the body of the uterus, and its length varies from $1\frac{3}{4}$ to 2 inches. A specimen decidedly exceeding this measurement is probably an early abortion.

Microscopical investigation may enable us to make a diagnosis; if sections of the substance passed show the presence of chorionic villi, the specimen is evidently the result of an early abortion.

The decidual cast of the uterus, sometimes discharged in cases of ectopic pregnancy, may also have to be distinguished

from the membrane of membranous dysmenorrhœa. The presence of well-marked decidual cells is in favour of the cast being due to ectopic pregnancy.

As to the obstructive theory of dysmenorrhœa, which was formerly put forward as explaining most cases of dysmenorrhœa, it may be said that it is now to a great extent discredited. The theory was that either on account of congenital stricture at the external or internal os uteri, or

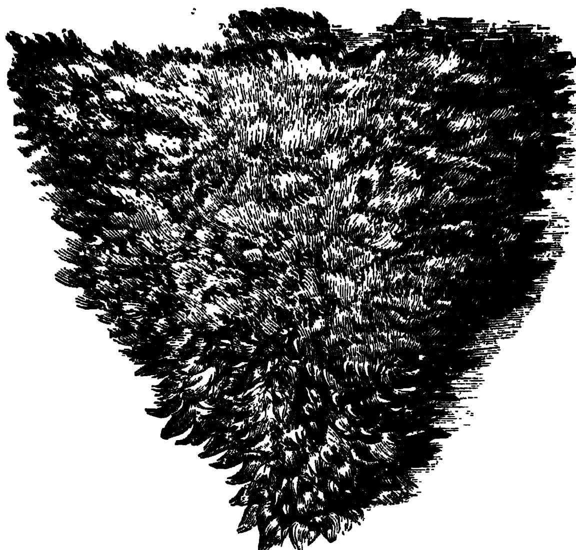


FIG. 21.—DYSMENORRHŒAL MEMBRANE AS SEEN UNDER WATER. (Sir J. Y. Simpson.)

The late Dr. Matthews Duncan wrote to me that he was sure this figure represented an early abortion, and went on to say: "The membrane of dysmenorrhœa never reaches that state of size and development. I have seen many like that on p. 77, no ovuline structures, merely decidua, and the proof is—cured by marital separation."

on account of flexion, an obstruction existed to the flow of blood out of the uterus, and that consequently excessive and painful contractions were excited.

Narrowing of the external os is met with, but it is not at all common; it is doubtful whether stricture ever occurs at the internal os, before the menopause, except as a result of operations, such as amputation of the cervix. It is con-

ceivable that there may be a spasmodic stricture at the internal os excited by the passage of the menstrual flow, just as a spasmodic stricture of the vaginal orifice is excited in cases of vaginismus by attempts at coitus. After the menopause narrowing, or actual occlusion, of either the external or the internal os, or at both orifices, is far from uncommon.

As regards flexion producing obstruction, we may also say that it has not been proved that it does so, or at least only in the slightest degree; on the other hand, it has been shown in many of the worst cases of dysmenorrhœa, by actually passing the sound at the time, that no obstruction existed.

And, further, it should be remembered, that in some cases where there is a narrow external os—"pin-hole os"—and occasionally even in those where a membranous cast is thrown off, there is no dysmenorrhœa at all.

Treatment.—In slight cases the patient should be advised to avoid over-exertion and any exposure to chill at the menstrual periods. Care should be taken that the bowels are kept acting a little more freely than usual, when the menstrual period is at hand. Putting the feet in hot water with mustard in it, and hot drinks at bedtime, are also useful. For medicine, camphor (gr. ij.-iij.) and a small dose, gr. $\frac{1}{8}$, of extract of belladonna may be given in pill thrice daily for a few days before as well as during the painful stages of the period. Bromide of potassium and aromatic spirits of ammonia are also useful, gr. x. to xx. of the former, with ♏xx. of the latter, thrice daily at the periods, at the same time doing all we can between the periods to improve the patient's general health by moderate exercise, tonics, and especially careful attention to the state of the bowels.

Guaiacum, sulphur, antipyrin, phenacetin, ichthyol, and castoreum form a supplementary list to choose from. Of these I have found antipyrin, phenacetin, and ichthyol the most generally useful. Tabloids, containing 5 grains of antipyrin, are convenient. Two should be taken when the pain is felt to be coming on; and if the pain is not relieved in two hours, another two may be taken. Not more than four tabloids should be taken in any one day.

Ichthyol is conveniently given in coated pills, containing gr. iiss. in each. One of these may be given twice or thrice daily for a few days before each period, and during the period.

Whether cases are slight or severe the line of treatment sketched out is that to be fully tried first, more especially for obvious reasons in unmarried women. After it has been tried and failed, the next thing to think of is dilatation of the cervix by bougies. The strictest attention to asepsis should of course be observed. I have never met with any case where bad consequences followed this operation myself, but I have heard of one case ending fatally, presumably from sepsis. It is better to regard this dilatation as a minor operation, and to perform it with all the usual aseptic precautions under anæsthesia, the patient remaining in bed a week or so afterwards. Starting from the size, No. 9, of Matthews Duncan's dilators that will normally pass, or a smaller one if that will not pass, the bougies are passed, one after the other, up to the largest size that can be passed without undue force. Hegar's dilators are equally suitable for the purpose. The best way is to pass one size after another till some *moderate* difficulty is experienced. What is required is as much dilatation of the internal os as is safe. Generally some slight bleeding occurs after the proper size has been passed. This may happen with No. 12 Hegar, or on the other hand no difficulty may be met with till No. 15 has been passed. No doubt the greater the degree of dilatation, the better the chance of relief in cases suitable for this line of treatment. The previous insertion of a laminaria tent generally enables the operator to dilate up to No. 16, or perhaps even up to 18 or 19 (Hegar), which is a much greater dilatation than could generally be safely obtained without the use of a tent. Strict antiseptic principles should be observed in this, as in all other operations of the cervix. The cervix is fixed with a volsella, during the dilatation. This measure must always be adopted before deciding that the ordinary sound will not pass the external or internal os in any particular case.

The treatment by dilatation is suitable for the cases in Group I., where there are no physical signs, and for cases

of narrow external os. In the cases associated with the *presence of inflammatory conditions of the pelvis, as evidenced by feeling lumps, or thick firm bands, in the neighbourhood of the uterus, and by the mobility of the uterus being less than normal, dilatation of the cervix is contra-indicated,* and may indeed be highly dangerous.

The choice here lies between being content with palliative treatment, and removing the uterine appendages.

It is possible that a sort of "massage" of the pelvic organs may give relief, where there are adhesions of only moderate

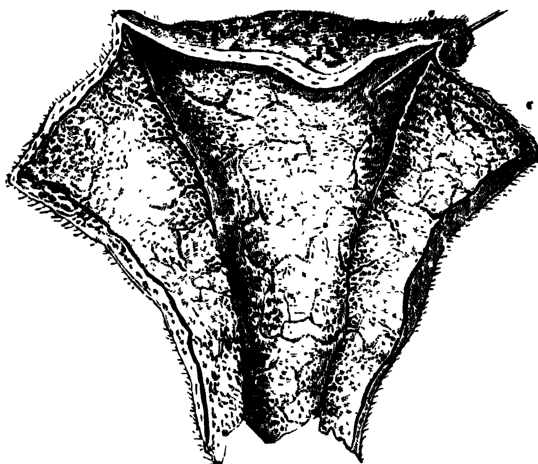


FIG. 22.—A DYSMENORRHŒAL MEMBRANE LAID OPEN (Coste).

If a portion of such a membrane is placed on a slide, and looked at with a low power under the microscope, it will be found to be perforated with numerous small holes corresponding to the openings of the uterine glands.

strength around the uterus limiting its mobility. Manipulation under an anæsthetic by breaking and stretching some of the adhesions might perhaps give relief; but treatment of this kind is obviously open to objection; besides it may be exceedingly dangerous, if there should happen to be a pyo-salpinx present.

As to treatment of the cases in Group III., it is to be remembered, that it is not always that the passage of casts of the uterus, or pieces of membrane, gives rise to any dysmenorrhœa. When there really is pain in these cases,

we know no very satisfactory treatment. The usual round of remedies already mentioned may be used. If these fail, dilatation with bougies, as already mentioned, may be tried, if the other conditions present do not contra-indicate it.

Curetting the endometrium, in addition to dilatation, has also been found useful, at least for a time.

DYSMENORRHŒA DUE TO DOUBLE UTERUS WITH ATRESIA ON ONE SIDE.

The condition mentioned is a very rare cause of dysmenorrhœa, of which I have seen one typical example. Nothing short of abdominal hysterectomy is likely to afford relief. The notes of my case are as follows:—

The patient was a single woman, aged 28. She had always suffered from considerable pain at the periods since they began at the age of 14. This pain had increased in severity during the last four years previously to her admission into the London Hospital, in September, 1909.

There was a history that an abdominal section had been performed in the provinces, about three and a half years previously, and that the left Fallopian tube, closed and dilated with blood, had been removed. The dysmenorrhœa was not relieved by this operation, and subsequently the cervix was dilated on two occasions, also without benefit. As regards the dysmenorrhœa, the pain began the day before the period, and continued till a few days after the period was over. There were nausea and vomiting on the first day. The average duration of each period was six days, and the loss was moderate.

As regards the physical signs in September, 1909, the uterus was rather larger than normal, considering that the patient was single. The increase in size was chiefly in width from side to side. On the left side there was a slight projection towards the peritoneal aspect, about the size of a hen's egg. The opinion formed of this at the time was that it was probably a small fibroid. The sound passed fully 3 inches. The cervix appeared normal. Shortly afterwards I dilated the cervix again, up to No. 14 Hegar, and the patient left the Hospital, with instructions to report as to her condition.

She was readmitted into the London Hospital on November 10, 1909. She had had two periods since leaving the Hospital, and the pain had been rather more severe than before the last dilatation. She was kept in the Hospital over the next period for observation. This occurred at the beginning of December, and there was no doubt at all of the severity of the pain. Accordingly, it was decided to perform abdominal hysterectomy.

Operation, December 17, 1909. On opening the abdomen the sigmoid flexure and bladder were found to be firmly adherent to the stump left by

the previous operation for the removal of hæmato-salpinx. Careful dissection was necessary to separate the adherent parts. The right uterine appendages were normal. The uterus was seen to be enlarged in a transverse direction, and during the operation the projecting portion on the left was believed to be a small fibroid. Supra-vaginal hysterectomy, with removal of the right uterine appendages, was performed in the usual way. *The patient made an uneventful recovery, and left the Hospital on* January 11, 1910.

Examination of the specimen.—On the left side of the uterus there was

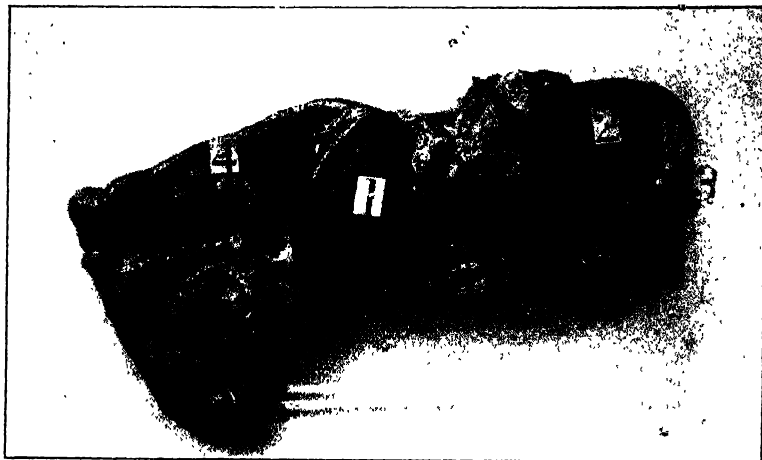


FIG. 23.—DOUBLE UTERUS WITH ATRESIA OF ONE-HALF.

The specimen removed at the operation.

The (normal) right half of the uterus laid open. 2. The rudimentary left half; its cavity has been laid open. It did not communicate with the cervix. 3. Stump indicating position of left Fallopian tube, which had been removed at a previous operation, in a condition of hæmato-salpinx. 4. Right uterine appendages, which are normal.

a projecting mass measuring 2 in. by ½ in. On section the mass was found to have a central cavity measuring ¾ in. in diameter. This cavity did not communicate with the cervix. Microscopical examination showed that this cavity was lined by mucous membrane identical with that found in the right half of the uterus.

lump in the private parts varying in size at different times, also of difficulty and pain in micturition, and some constant pain in the left side, she had had these symptoms for seven weeks

The catamenia ceased two years ago, but for the last two years she had had a yellow discharge streaked with blood

She had been getting thinner lately

On examination, in the situation of the urethral orifice there was an irregularly-shaped ulcerated cavity, admitting the tip of the finger The walls of the cavity were formed by hard tissue, and induration extended

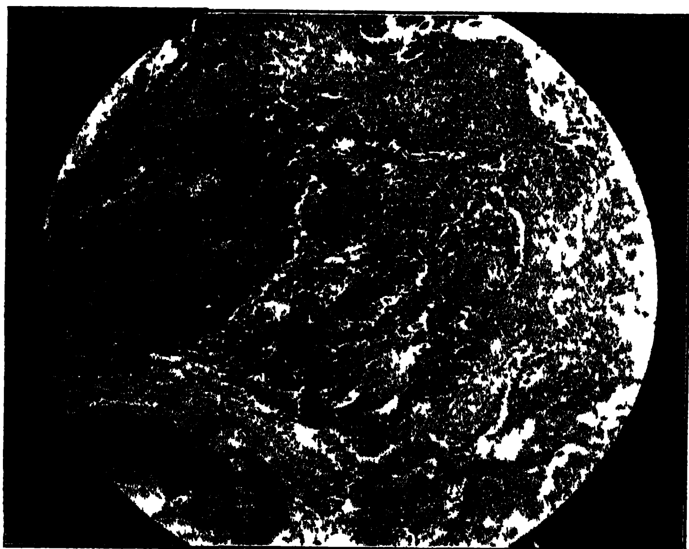


FIG 32 —SQUAMOUS EPITHELIOMA OF THE VULVA

The section shows the invading processes of epithelium with numerous cell nests separated by inflammatory round celled exudation Below, and to the left, is seen part of the transverse section of a hair follicle From a patient, aged 42, who had had eight children The symptoms dated from two years previously There was a large fungating malignant growth on the anterior part of the vulva

up the anterior vaginal wall a distance of 2 inches The surface of the cavity bled easily on touching it Two glands in both groins were enlarged.

The disease most often occurs on one or other labium majus, or about the region of the clitoris, it may also begin in the fossa navicularis

The patients are generally advanced in life; most of the

cases I have seen have been in women over sixty. I operated some years ago on a woman eighty-four years of age with epithelioma of the vulva, sent to me by Dr. Alexander Grant. The operation included removing two enlarged lymphatic glands from the right groin. She did well after the operation.

Treatment.—When the disease is seen sufficiently early—that is to say, when it appears possible to take away the

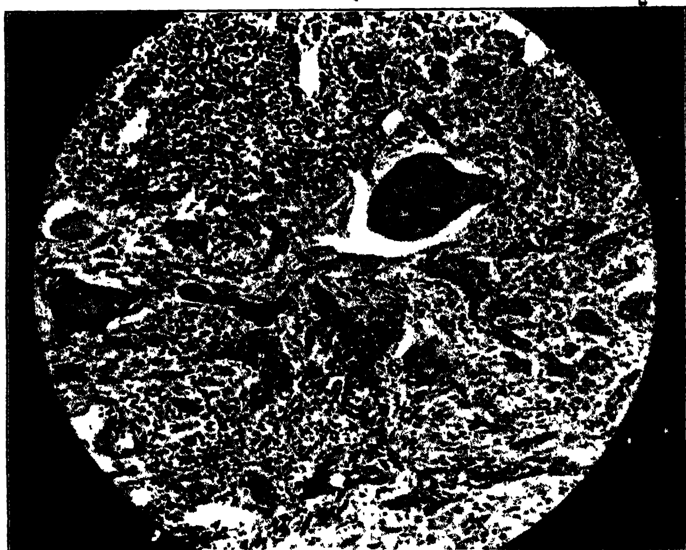


FIG. 33.—EPITHELIOMA OF THE VULVA.

The section shows secondary deposits of squamous epithelium in an inguinal gland removed at the same time as the primary growth from case corresponding to Fig. 32. Near the centre is seen a large cell-nest; numerous plugs of epithelial cells are scattered through the lymphocytic tissue.

growth completely, with a fair margin of apparently healthy tissue—an operation should be advised. The glands in one groin or in both groins are generally involved, but this does not contra-indicate operation, if it appears feasible to remove the affected glands at the same time. In removing the growth from the vulva I prefer to use Paquelin's cautery. In order to remove the glands from the groin an incision parallel to Poupart's ligament, 3 inches or more in length, is made

over the affected glands, and these are dissected out, taking away a fair amount of the fat surrounding them at the same time. A few vessels generally require tying with fine catgut, and the incision is closed with silkworm-gut sutures. In a case of epithelioma of the vulva it is best to remove the glands on both sides, even if the glands are apparently not affected. Local recurrence of the disease is not necessarily of unfavourable significance. For instance, in one of my cases three operations were performed for local recurrence of the growth, and the patient was known to be well and free from recurrence five years after the third operation.*

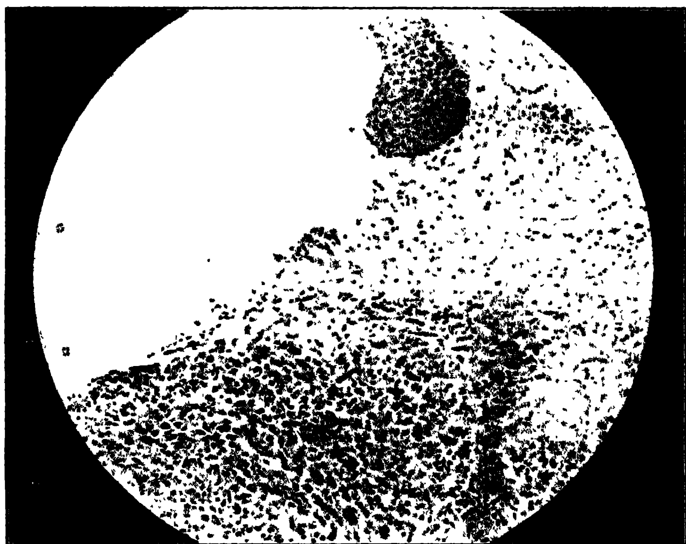


FIG. 34.—PRIMARY SARCOMA OF THE VULVA.

A non-pigmented, mixed-celled sarcoma (round and spindle-celled). The section taken through the edge of the growth shows the stratified epithelium and deeper layers of the cutis above, and to the right.

Sarcoma of the vulva.—Clinically there is no great difference in the symptoms and signs from what is seen in cases of carcinoma of the vulva.

I showed a specimen of a sarcomatous growth removed from the vulva at a meeting of the Obstetrical and Gynæco-

* *Trans. Obst. Soc. Lond.*, vol. xlviii. p. 163.

logical Section of the Royal Society of Medicine in November 1910.

The patient was 59 years of age, and when first seen had a hard, irregular, dusky-red mass the size of a hen's egg projecting from the posterior two-thirds of the right labium majus. The growth had a sharp overhanging edge, and its surface was covered by a thin, offensive, slightly bloodstained discharge. One definitely enlarged gland was felt in the right groin.

The growth was removed by dissection with Paquelin's cautery, and the lymphatic glands were also removed from both groins.

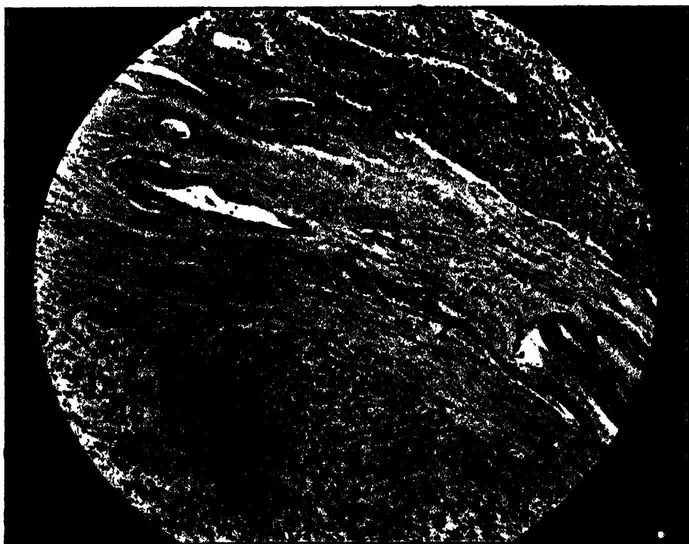


FIG. 35.—SECONDARY SARCOMATOUS DEPOSIT IN (RIGHT) INGUINAL GLAND.

Removed with the primary growth from same patient as the tissue shown in Fig. 34. A fibrous tissue capsule bisects the section; above is seen normal lymphocytic tissue; below sarcomatous tissue (round and spindle cells) identical with the primary growth. (Notes of case in text.)

Microscopically the growth was a large oval and spindle-celled sarcoma. The gland from the right groin showed a secondary deposit of the same structure as that of the primary growth.

Gangrene of the vulva is a rare complication of acute specific fevers in children; and in adults, is a rare complication of puerperal fever.

Fibrous tumours and fibrous polypi of the vulva are met

with, but they are exceedingly rare. In Fig. 36 is seen a large pedunculated fibrous tumour of the vulva.

Kraurosis of the vulva.—This is a very rare disease. It always occurs after the menopause. It is characterized by atrophy of the cutaneous structures of the vulva. The skin becomes tense and dry, and the result may be to cause considerable contraction of the vaginal orifice. There may



FIG. 36.—PEDUNCULATED FIBROUS TUMOUR OF THE VULVA.

The patient was a married woman aged 44, had never been pregnant, and had been conscious of something growing from the private parts for fifteen years. The tumour measured 7 centimetres by 5 centimetres. It grew from the frænal folds of the clitoris. The surface of the growth was covered by normal epidermis; the substance of the growth consisted of œdematous fibrous tissue.

be pain and pruritus, and the narrowing of the vagina necessarily causes dyspareunia. Dudley quotes Longyear as considering that the essential lesion is a cirrhotic layer of fibrous tissue underlying the cutaneous structures. This contracts, causing interference with the blood supply, and

pressure on the nerves, as well as the shrinkage of the parts. The sebaceous and sweat glands have disappeared.

Apparently the best treatment is a complete removal of the skin and subjacent fibrous tissue in the affected area.

PRURITUS OF THE VULVA.

By this is meant itching of the external genitals. It is therefore, of course, a symptom.

Etiology.—Sometimes no cause can be discovered to account for it; more frequently it occurs in association with some of the following conditions:—

1. Pregnancy.
2. Cancer.
3. Vulvitis and vaginitis, particularly the early and late stages of these affections. Even if there was no vulvitis to begin with, scratching the parts, from which, as a rule, the patient cannot refrain, will soon set it up.
4. Diabetes.
5. Pediculi pubis.
6. Thread-worms.

Sometimes it only occurs at the menstrual periods. Again, at the menopause it is not an uncommon symptom.

The itching is usually worse at night, and it may prevent the patient sleeping.

It is necessary occasionally to be careful to avoid mistaking an irresistible desire for sexual gratification leading to masturbation for pruritus, as the following case shows:

A patient, aged 62, who had been a widow for thirty-one years, was sent to me on account of what was said to be intractable pruritus of the vulva. On examination of the parts there were none of the usual appearances commonly met with in ordinary pruritus, except slight irritation of the skin of the nymphæ and about the clitoris. The patient volunteered the statement that what she really suffered from was not itching, but a great desire for sexual intercourse. She had had this feeling for several months, and had practised masturbation during that time. Her mental condition was certainly peculiar and unstable, and probably this had to do with the symptom she complained of. The case was not one of ordinary pruritus vulvæ, but rather one of nymphomania.

In another case also, though here the patient was quite sound mentally, although the condition had been treated as

pruritus before I saw it, by various ointments and lotions, and also by the actual cautery, and the *X*-rays, without benefit, it proved on investigation to be really a case where the real trouble was irritation, referred to the body and glans of the clitoris, leading the patient to practise masturbation. There was considerable thickening of the prepuce of the clitoris and of the nymphæ, and the surface was considerably excoriated. The patient was fifty-five years old, and was most anxious to be relieved, and as everything had hitherto failed, I removed the clitoris and the whole of the hypertrophied and thickened vulvar skin. The result was most satisfactory, and so far the patient has remained quite free from her previous symptoms.

Treatment.—We try to remove any morbid condition that may be present—for example, vulvitis or vaginitis, pediculi pubis; when no local cause exists to account for the pruritus, or when it is due to some constitutional state, we have only to rely on empirical treatment. This consists partly of internal remedies, and partly of local applications.

The internal remedies that should be tried are:—Bromide of potassium in scruple doses; and belladonna, best given as recommended by Dr. West in the form of pill with camphor (Ext. belladonnæ, gr. ½, camphor, gr. iij., M. ft. pil. j.); if dryness of the throat occurs, the dose of the belladonna is reduced.

Local applications.—Some one of the following may be tried:—

1. Unguentum cocainæ, B.P.
2. Glycerin. plumb. subacetat. (℥ ss. to ℥ v. of water).
3. Chloroform and olive oil (ʒ j. to ℥ j.).
4. A lotion containing acetate of morphia (gr. ij. to ℥ j.).
5. Borax lotion (℈ j. to ℥ j.).
6. Lead and opium lotion (4 grains of extract of opium to ℥ j. of dilute lead lotion).
7. Glycerine and belladonna (℈ j. of extract of belladonna to ℥ j. of glycerine).
8. Carbolic acid lotion (1 to 60).
9. Liq. carbonis detergens (ʒ j. to ʒ ij., to Oj. water).
10. Friar's Balsam painted over the parts occasionally is also useful.

11. The Ichthyol liniment mentioned above (p. 89) is also very useful.

The preparation used should be applied to the whole of the vulva frequently, or a piece of lint soaked in the application may be placed between the labia.

Other applications that may be tried are:—

℞ Sod. Bibor., ℥iij.
Ol. Menth. Pip., ʒij.
Ft. pulv.
ʒj. to Oj. warm water for bathing the parts.

Or—

℞ Menthol, ʒj.
Ol. Olivæ ad ℥j.

Or—

℞ Acid. Salicyl., ℈j.
Zinc. Oxid. } āā ʒiv.
Pulv. Amyli }
Vaseline, ʒij.
M.

Or—

℞ Calamin, ʒjss.
Ol. Amygdal. ℥ij.
Aq. Calcis ad ℥viij.
Ft. lotio.

The pruritus of diabetes is best relieved, however, by placing the patient on a strict diet, and giving her a pill containing codeine (gr. $\frac{1}{4}$ to gr. $\frac{1}{2}$) twice daily.

If the laceration has involved the sphincter ani, in addition to the raw surface in the above figure, there will be a triangular aperture in the front wall of the rectum, the apex of the triangle being upwards, and the ends of the torn sphincter one at each end of the base line (Fig. 41). In passing the first suture it should be passed embedded all the way in the tissue immediately bounding the triangular interval, so that when it is tied, the three points of the triangle will be approximated, just as the mouth of a bag with a string running round it is closed by drawing on the string. This is sometimes known as the "purse-string" suture.

The triangular gap in the rectum may also be closed

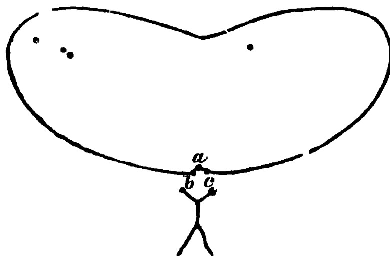


FIG. 42.—The suture tightened and twisted, the points *a b c* approximated, so as to close the gap. The rest of the raw surface is then dealt with as in Fig. 39.

by stitching it from the apex downwards with interrupted catgut sutures, or better, a continuous suture may be used.

It is best to use chromic gut (prepared as described above) for ruptures involving the rectum. Indeed some authorities use chromic gut entirely for suturing any rupture of the perineum. It is more comfortable for the patient than stiff silkworm gut, and has also the advantage that chromic-gut sutures, unlike those of silkworm gut, do not need to be removed. Still I think the "purse-string" suture should anyhow be of silkworm gut, and I prefer this material for the whole operation, except in suturing the tear in the rectum, for which I prefer a continuous chromic-gut suture.

The remaining raw surface is then treated as already described.

In Fig. 42 the "purse-string" suture is of silver wire, and is consequently shown as twisted.

Secondary Operations for Rupture of the Perineum.

When extensive lacerations of the perineum have not been sutured directly after labour, or when, having been sutured, union has not occurred, it is necessary to perform a plastic operation to restore the previous condition of the parts.

Such an operation should not be done until sufficient

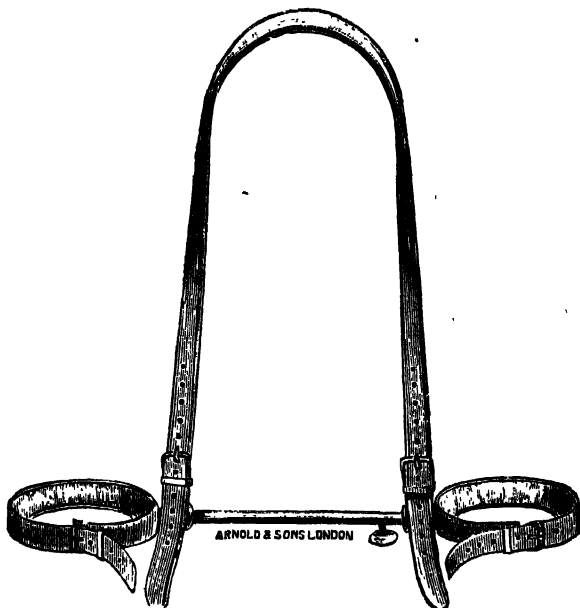


Fig. 43.—Clover's Crutch.

The leg pieces fasten round the legs just below the knees. The long strap passes under the patient's neck and under *one* arm, and is adjusted so as to flex the thighs on the abdomen to the required extent. The bar between the leg pieces consists of an outer tube, and an inner rod sliding in it; the rod is drawn out of the tube till the knees are sufficiently separated, and is then fixed by the screw.

time has elapsed since the rupture for the parts to have passed into a quiescent condition, say at least six weeks after labour.

The indications for operation are:—1. Incontinence of fæces, or flatus, owing to the rupture having involved the sphincter ani. 2. When it is desirable, on account of pro-

lapse of the vagina, or uterus, for the patient to wear a vaginal pessary, such as the ordinary india-rubber ring.

If there has been an extensive rupture of the perineum, such a pessary will not stop in. The object of the operation in a case of this kind is to narrow the lower end of the vagina, so as to enable the patient to retain a pessary. In such cases it is best to do a colporrhaphy, besides restoring the perineum.

Preparation of the patient.—She should remain in bed for two days before the operation, and two nights before the operation should have a suitable aperient that will ensure thorough evacuation of the bowels. If there is any discharge from the vagina, this should be cured, or at all events

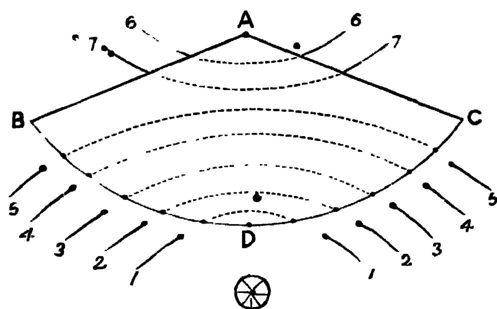


FIG. 44.

checked, by suitable treatment. On the morning of the operation a copious enema should be given.

The operation.—Three assistants are advisable, one to give the anæsthetic, and two to help the operator. The patient is secured in the lithotomy position by means of Clover's crutch (Fig. 43).

The parts should have been previously shaved. The skin in the neighbourhood of the laceration is well rubbed with green soap dissolved in alcohol, then with biniodide of mercury in spirit, 1-500, and then with perchloride lotion, 1-1000.

The vagina is now syringed out with perchloride lotion, 1-1000. An assistant stands at each side of the patient. The next step is to mark out the surface to be made raw. The shape of this depends on the exact nature of the case. If the rupture has not involved the sphincter ani, Fig. 44

shows the shape and position of the surface to be freshened. The points B and C correspond to the posterior extremity of the labium minus on each side, and it is well to fix a pair of Wells' forceps on B and C, where the skin and mucous membrane meet, to serve as landmarks.

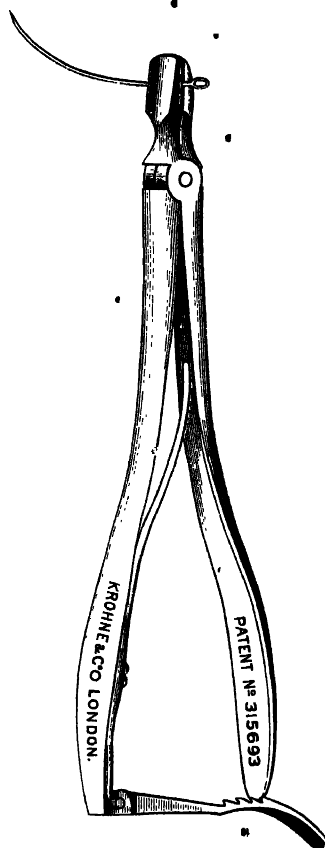


FIG. 45.—RAMPLEY'S NEEDLE-HOLDER.

The point A is taken on the middle line of the posterior vaginal wall about an inch, or an inch and a half, up the vagina ; a pair of Wells' forceps should be fixed on it also.

An incision, mucous membrane deep, is now made with a scalpel from A to B, and A to C, and also along the line

B D C, just where the mucous membrane of the posterior vaginal wall meets the perineal skin. Beginning posteriorly, the mucous membrane is now dissected off the area marked out. During the whole proceeding the parts are made tense by each assistant pulling towards himself the labium majus and adjoining skin on his side. Sometimes it is convenient

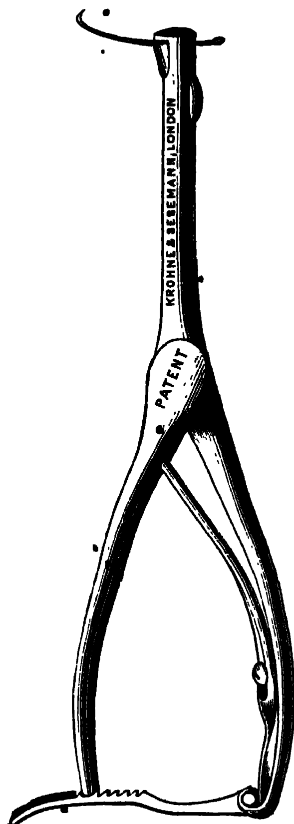


FIG. 46.—HAGEDORN'S NEEDLE-HOLDER.

to put a pair of Wells' forceps on the point D; traction on this pair of forceps helps to make the parts tense, and therefore facilitates the dissection. The sutures are inserted as in the figure, beginning behind. 1, 2, 3, 4, 5, are passed by means of a nearly straight, or slightly curved, needle in a handle. For these, fishing gut may be used. It is an

advantage to stain the fishing gut a reddish colour, as it is then more easily seen. *These sutures should be completely buried beneath the raw surface. While they are* being passed, the forefinger of the left hand is in the rectum as a guide. Two or three sutures should be passed as at 6 and 7 in the figure. These are inserted by means of an ordinary needle in a needle-holder * (Fig. 45), and the material used for them should be catgut, as they will not then require removal. Sutures 6 and 7 should also, if possible, be buried completely under the raw surface; it is important that they should enter at the very edge of the cut mucous membrane to avoid any of it being tucked in when

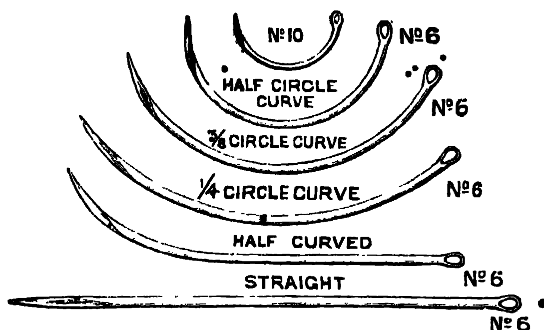


FIG. 47.—HAGEDORN'S NEEDLES.

they are tied. All blood and clots being carefully sponged away, sutures 6 and 7 are tied first, and then 1, 2, 3, 4, and 5 in numerical order. Before they are tied the screw of the crutch should be loosened, and the knees brought together. It is important not to tie the sutures too tight. The ends of the sutures should be left long, say 2 inches. The patient's knees are tied together, a pad of sterile gauze is placed over the perineum, and kept in place by a T-bandage.

When rupture has involved the sphincter ani, the raw surface to be made is shown in Fig. 48.

In this figure A, B, and C are the same points as in Fig. 44. D and E correspond to the extremities of the

* Hagedorn's needle-holder and needles (Figs. 46 and 47) are very convenient in this and similar operations.

torn sphincter. F indicates the apex of the triangular interval in the front of the rectum caused by the rupture of the sphincter. Incisions as before are made along the lines A B D and A C E; in addition, an incision is made from F to D, and F to E. The mucous membrane is then dissected off the whole surface marked out. A better plan, however, is to dissect up the mucous membrane from behind forwards, starting at B D F E C, and so raise a flap towards the vagina, not cutting it off, but retaining it to keep the vaginal discharges out of the wound. If there is too much of the flap, a little may be cut off to secure neat adaptation. The chief difference from the former case is in passing the first suture—the "purse-string" suture. It is passed buried

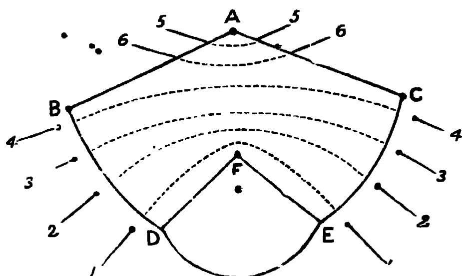


FIG. 48.

completely in the tissues. When it is tightened, the points E F D are brought into contact, just as a bag is closed by drawing on a string running round its neck.

Besides using the "purse-string" suture, the side F E may be stitched to the side F D with interrupted catgut sutures, or, better, by a continuous catgut suture.

After-treatment.—The patient should lie on her side, not on her back, so that any discharge may escape more readily. The vagina may be gently douched twice daily with carbolic lotion (1-60), if we have a nurse who can be trusted to do this without any traction on the parts. The catheter is passed two or three times in the twenty-four hours. As regards the bowels, practice varies; some operators give aperients so as to keep the bowels acting more or less every day from the first. For my own part, I prefer to keep the

bowels from acting till five days after the operation. An action may then be secured by a dose of castor oil, preceded some three or four hours by an enema of 4 ounces of olive oil. The diet should be very light ; I prefer not to allow meat or fish till the end of the first week.

LAWSON TAIT'S OPERATION FOR RUPTURE OF THE PERINEUM.

The distinguishing features of this operation are :—

1. The raw surface is made by splitting the recto-vaginal septum with scissors, and by dissecting laterally as described below ; no tissue is removed.

2. The sutures are not passed through the skin at all,

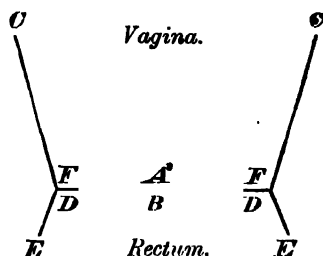


FIG. 49.—Lines of incision in Tait's operation for ruptured perineum (Lawson Tait).

their points of entry and final exit being in the raw surface made, and about $\frac{1}{8}$ *inch internal to the edge of the skin* on each side.

3. The sutures are not completely buried, but appear in the bottom of the wound to the extent shown by the black lines below B and C in Fig. 50.

The patient being in the lithotomy position, the recto-vaginal septum is split by scissors entered at the point F on one side, and carried across to the F on the other side. From the point F to C on each side an incision running forwards and a little outwards is also made with the scissors: the length of it is about an inch. Similarly, incisions are made about $\frac{1}{2}$ inch long, running backwards and outwards from F to E on each side. Fig. 49 shows the lines of incision.

The shallow trenches resulting from the original incisions are gradually deepened by the scissors (working in a direction at right angles to the general surface of the perineum), till the points F can be raised with pressure forceps upwards, and approximated in the middle line; a triangular flap is thus turned upwards and inwards on each side. Similarly the points D are drawn downwards (the patient being in the lithotomy position) and inwards, so as also to lie close together in the middle line.

The resulting raw surface is shown in Fig. 50. A B C D is the boundary of it towards the vagina. The sides in the figure are the edges of the skin. Fishing-gut sutures are passed either with a curved needle in a handle, or with an

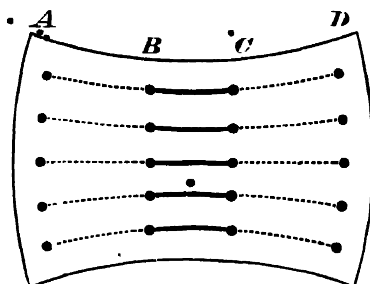


FIG. 50.—Raw surface and position of sutures in Tait's operation for ruptured perineum (Lawson Tait).

ordinary curved needle held in a needle-holder. The dotted lines indicate the extent to which the sutures are buried beneath the raw surface; when the sutures are tied, Tait claimed that a sort of flap valve is formed towards the vagina and rectum respectively. The sutures are left in for a fortnight.

The vagina is washed out daily with a weak antiseptic lotion.

I have now tried this operation in a large number of cases, and have been well satisfied with it. Probably every one who operates at all frequently introduces some slight modifications in this and other operations.

I find it generally convenient to remove a little of the lowest part of the vaginal flap, say about a quarter of an inch

of it. In this way a neater result has seemed to me to be obtained.

Also I think it is decidedly desirable, in cases of rupture involving the sphincter ani, to stitch the gap in the rectum separately with a continuous catgut suture, besides passing a buried silkworm-gut "purse-string" suture round the triangular gap in the rectum.

I find that students and some others have a great deal of difficulty in understanding the description of the "flap-splitting" operation (Tait's operation). I have accordingly had some figures prepared, which I hope may make the matter clearer. I will therefore again describe the "flap-splitting" operation, with the modifications I find advantageous, and ask the reader to follow it with the coloured diagrams (Plates II. and III., Figs. 1, 2, 3, 4, 5).

The modified "flap-splitting" operation: (Tait's operation).

The patient is supposed to be in the lithotomy position as before (Plate II., Fig. 1).

Pushing the point of the scissors in at B a depth of ½ inch or so, an incision is made in the recto-vaginal septum from B to A.

Similarly an incision is made from A to E at the junction of the skin and mucous membrane; this is actually about an inch or rather more in length. The same is done on the opposite side from B to F. Also incisions are made from C to G, and from D to H.

Now a pair of Wells' small forceps is placed on the corner A and on the corner B, and these points are gradually raised by dissecting till two somewhat triangular flaps can be turned forwards, as seen in Fig. 2. Similarly a pair of Wells' forceps is placed on the corner C, and one on the corner D (Fig. 1), and these are gradually raised and turned backwards towards the rectum, as shown in Fig. 2.

The dissection is continued till A and B are turned so far forwards that, owing to the laxity of the vaginal flap, the border E A B F is actually somewhat convex. Also, by continuing the dissection, the corners C and D are brought to



FIG. 51.—COMPLETE RUPTURE OF THE PERINEUM.

Showing the appearance of the parts before operation. A pair of Wells' forceps has been placed on the region corresponding to the end of the torn sphincter on each side. Between the forceps is seen the lower edge of the remaining recto-vaginal septum



FIG. 52.—COMPLETE RUPTURE OF THE PERINEUM.

The appearance of the perineum at the end of the operation.

lie as in Fig. 3. If there is too much of the anterior flap, a little of it may be trimmed off. This is often unnecessary.

The next step is to pass two or three deep sutures of silkworm gut from side to side, buried as much as possible (Fig. 4). The ends of each suture are held by a pair of Wells' forceps. These are now held forwards out of the way, and the operator passes the buried silkworm-gut "purse-string" suture round the triangular gap in the rectum (Fig. 4, C J D), and also sutures it with a continuous catgut suture, as shown in Fig. 5. This suture, it will be seen, is passed so that it does not appear towards the rectal mucous membrane. The "purse-string" suture is tied, and then the deep silkworm-gut sutures, the most posterior being tied first.

One or two superficial catgut sutures may be needed to keep the puckered edge of the vaginal flap in place.

The catgut rectal suture has not to be removed; the deep fishing-gut sutures and the "purse-string" suture are taken out in about ten days

As regards other methods of suturing, good results can be obtained by stitching the parts together from the bottom of the wound by means of buried chromic-gut sutures inserted in such a way as to bring together the surfaces it is desired to approximate nicely Even when this method is adopted, it seems desirable to support the wound by means of at least one silkworm-gut suture passed deeply from side to side.

In the following case the perineum had been completely ruptured more than twenty years before the patient came under my observation. An operation was said to have been performed by another physician twenty years ago, the result of which had been unsuccessful owing to "erysipelas having set in in the wound."

E. N , a married woman, aged 52, was admitted into the London Hospital under my care on December 15, 1893. She had had ten children, and one miscarriage.

The perineum had been ruptured at the birth of the fourth child, which was born dead. Its head was very large, and it had been "delivered by much pulling." Instruments had also been used at the birth of some of the later children.

She had had incontinence of fæces ever since the birth of the fourth child, more than twenty years ago.

On examination there was found to be a complete rupture of the

PLATE II.

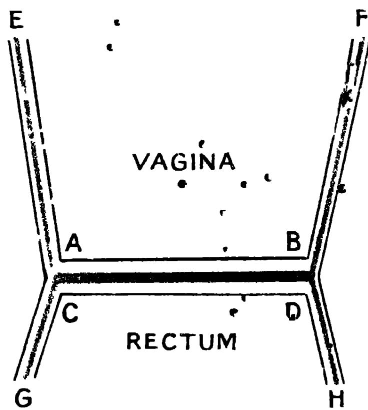


FIG. 1.

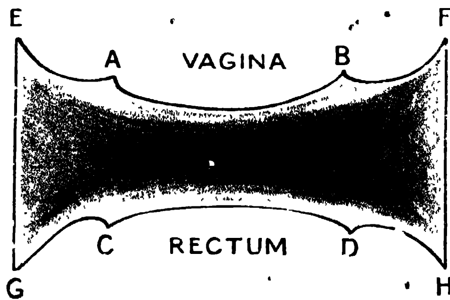


FIG. 2.

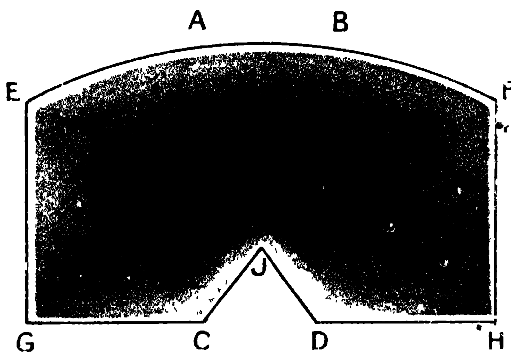


FIG. 3.

PLATE III.

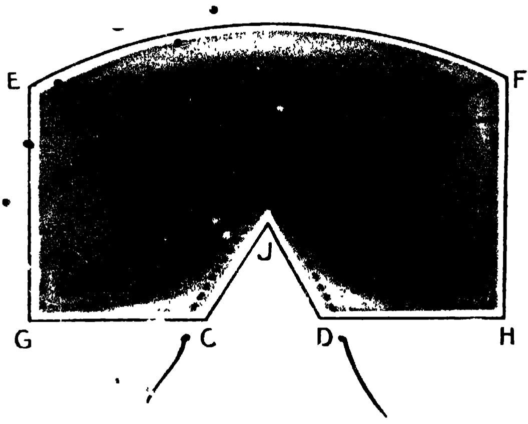
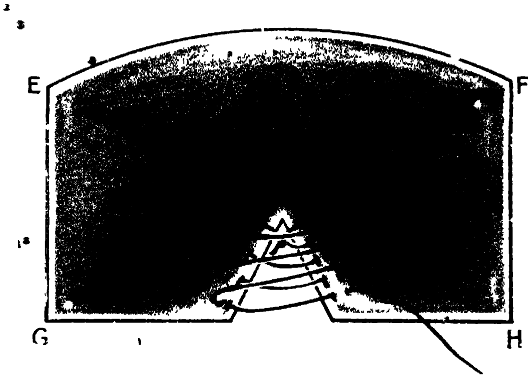


FIG. 1



perineum (*i.e.*, extending through the sphincter ani), and some of the rectal mucous membrane was seen protruding. There was fæcal matter about the external genitals.

The uterus was fairly movable; there was some "thickening" to the left of it, and some also, but less, to the right. There was slight prolapse of the anterior vaginal wall.

On January 14, 1894, I performed the modified Tait's operation described on p. 126. The result was quite successful, and the patient left the Hospital on January 29, having completely regained control of the sphincter ani.

CHAPTER VII.

DISEASES OF THE VAGINA

VAGINITIS.

THE essential cause of vaginitis is infection with some micro-organism, just as is the case with vulvitis. In speaking of the latter a list of the principal micro-organisms responsible for the inflammation has been given, and to this the reader is referred, as the same micro-organisms may set up vaginitis.

According to Döderlein (as quoted by Dudley), two secretions of the vagina are formed—one, the normal secretion, whitish, milky, and strongly acid without mucus; the other, pathological, is yellow, faintly acid, or neutral, or alkaline, and mixed with mucus.

In the normal secretion a non-pathogenic vaginal bacillus is constantly found, and this causes the secretion to be acid—the acid present is lactic acid. The normal vaginal bacilli were found to be hostile to the growth of staphylococcus pyogenes aureus.

In the pathological secretion the normal vaginal bacilli are decreased, and pathogenic micro-organisms are present.

The pathological secretion is said usually to originate in the cervix; it tends to neutralize the acidity of the normal vaginal secretion, and so renders the vagina more suitable for the development of pathogenic organisms—the majority of which find an acid medium unsuitable for their development.

At the same time various other factors are often present which by diminishing the resistance of the tissues allow the micro-organisms to effect a lodgment, and produce the resulting vaginitis.

Such predisposing factors are:—

1. *Mechanical injury* produced by foreign bodies (hair-pins, pieces of sponge, ill-fitting pessaries, &c.); excessive

coitus; difficult labour—in this case more or less sloughing, with perhaps perforation into the bladder or rectum, is not uncommon.

2. *Irritating discharges, e.g.*, the discharges in cases of uterine cancer, or the lochia after delivery.

3. *Vaginal injections* used too hot, or too strong.

As examples of *constitutional states* in which vaginitis is likely to arise as a subordinate complication may be mentioned :—*diabetes, alcoholism, specific fevers, diphtheria.*

Further, in *old age* vaginitis is liable to occur, usually without other apparent predisposing cause, so that we speak of a "senile vaginitis."

Again, *pregnancy* and *menstruation* predispose to vaginitis.

ACUTE VAGINITIS.

Symptoms.—The patient complains of:—

A sense of heat and throbbing in the vagina.

Pain in passing water, and frequent desire to pass it.

Often also of pain in walking, if there is co-existing vulvitis.

A greenish-yellow discharge.

A sense of general malaise.

Physical signs.—If there is vulvitis as well (as is usually the case), there will be the appearances described under Acute Vulvitis.

Great swelling, redness, and perhaps excoriation of the external parts.

Tenderness on attempting to pass the finger into the vagina.

If a small speculum can be introduced, the vaginal mucous membrane will be seen to be red and raw-looking, and secreting a greenish-yellow discharge, perhaps slightly blood-stained. The vaginal mucous membrane feels hot, and is greatly swollen, but its rugæ are not obliterated. It bleeds easily on examination. The urethra will be found swollen, and pressure along it will probably cause pus to exude from the meatus.

The thermometer may show slight elevation of temperature.

Such are the characteristics of acute vaginitis, and it is important to notice that we cannot distinguish by mere *clinical* examination with certainty between gonorrhœal vaginitis and that due to other causes.

It is, however, possible in some cases for an expert in bacteriology to distinguish between them. If gonococci can be discovered in the discharge, the vaginitis is of course gonorrhœal. On the other hand, not finding gonococci does not exclude gonorrhœa as the original cause of the vaginitis; for in chronic cases of gonorrhœal origin it often happens *that the gonococcus cannot be found.*

An acute vaginitis runs its course in ten days or a fortnight, and either gets well, or lapses into a chronic stage.

Chronic Vaginitis.

Vaginitis may be chronic from the first, as, for example, in the senile variety; or chronic vaginitis may be the sequel of an acute attack.

Symptoms.—There may be a slight itching or sense of heat in the vagina, and slight smarting on passing water; often, however, the patient complains of little except that she has a yellow discharge.

Signs.—The speculum shows the mucous membrane to be redder than normal, and we see the discharge. In old people the mucous membrane is often seen to have become smooth, the rugæ having been obliterated. There is little or no tenderness.

Variation in the distribution of vaginitis.—Whether the inflammation be acute or chronic, it will be found sometimes that the whole vagina is affected, sometimes only a part of it. For instance, the inflammation may affect only the lower half, or only the upper half of the vagina; or again the summits of the ridges may be inflamed, while the depressions between them escape. Sometimes the appearance presented is that of red spots dotted over the surface, separated from one another by pale areas, "spotty vaginitis."

Granular vaginitis is the name given to that variety of vaginitis in which we find the surface of the vagina studded with hemispherical elevations, the size of a pin's head. It

may result from any of the other forms of vaginitis, but is rarely seen apart from pregnancy (Thomas).

Ulcerous vaginitis.—Sometimes we find ulcers on the vaginal walls in cases where we have no reason for suspecting the presence of syphilis, as in the following instance :—

J. R., single, aged 25, came to the London Hospital in August, 1886, complaining of pain across the lower abdomen, a sense of soreness in the vagina, and of a whitish-yellow discharge. There was no history of syphilis, nor any sign of it. *On examination the hymen was found to be torn. Through the speculum two ulcers were seen at the upper end of* the vagina, one on the anterior and one on the posterior wall; these were about ½ inch to ¾ inch in extent, and there were one or two smaller ulcers. She was given lead lotion as an injection, and general tonic treatment. *November* 3, ulcers much as before described; she was given 5 grs. of iodide of potassium thrice daily for the next four months. In April, 1887, the following note was made: "There is a semicircular ulcer, depressed 1/16 inch with a sharply defined edge on the anterior lip of the cervix, and a similar but rather triangular ulcer on the right lateral fornix, its largest side about an inch long. The base of this ulcer is dry and yellowish." The iodide of potassium was omitted, and she was given an injection of glycerine of subacetate of lead. A month later the patches had healed, the situation they had occupied being puckered, and a little depressed.

Complications.—An acute vaginitis, particularly if due to gonorrhœa, is likely to be complicated by urethritis and cystitis; and the inflammation may also extend from the vagina to the cervix,* thence to the body of the uterus, and so along the Fallopian tubes to the pelvic peritoneum; thus we may have cervical endometritis, endometritis of the body of the uterus, salpingitis, and pelvic peritonitis, all resulting from an acute vaginitis. There will also, almost certainly, be vulvitis, often also abscess of the ducts of Bartholin's glands. Further, buboes may occur on account of the vulvitis.

In cases where the inflammation has spread to the pelvic peritoneum, the fimbriated ends of the Fallopian tubes will almost certainly be sealed up, so that no trace of the fimbriæ remains, the outer end of each tube having become per-

* In many cases of gonorrhœa the cervical mucous membrane is the part primarily infected, and, if vaginitis occur, then it is secondary to the gonorrhœal cervical inflammation.

manently adherent to the corresponding ovary. When this happens on both sides (as it usually does when it happens at all), an incurable sterility is necessarily produced.

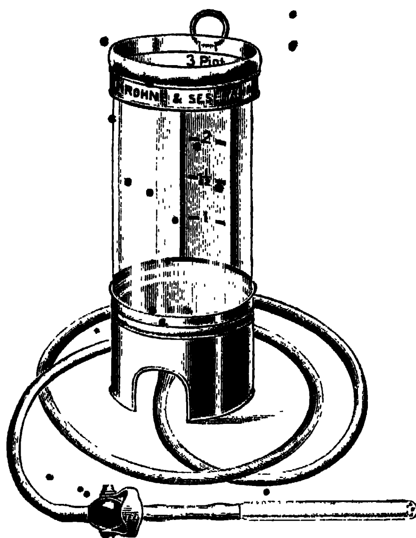
Another complication of gonorrhœal vaginitis is arthritis. It is a very rare complication. I have seen a few cases of it. In one case, sent to me by Dr. Downes, of Hornsey, the wrist was the joint affected.

Treatment.—In acute cases hot hip baths and rest in bed for the first few days, with vaginal injections of very weak perchloride of mercury lotion (1-5000) twice daily may be advised. A smart saline purge will also be useful. As the acute stage subsides, astringent lotions may be used, beginning with glycerine of subacetate of lead (℥ss. to Oj. of water), followed later by alum, tannic acid, or sulphate of zinc (ʒj. to Oj. of water). An injection of permanganate of zinc (gr. ½ to Oij.) is also very useful at this stage. If there is pain on micturition, this may be relieved by giving barley water, and a mixture containing tincture of hyoscyamus and bicarbonate of potash. In chronic cases we may proceed with the astringent applications enumerated from the first. In many cases after apparent cure the case relapses when treatment has been left off; again, many cases do not improve in spite of suitable treatment; this is often because the patient does not use the vaginal douche in an effectual manner. Vaginal douches are best given by means of the hydrostatic douche apparatus, fitted with india-rubber tubing and a glass vaginal pipe (see Fig. 53). The patient should lie down with her hips raised over a bed-bath when using douches.

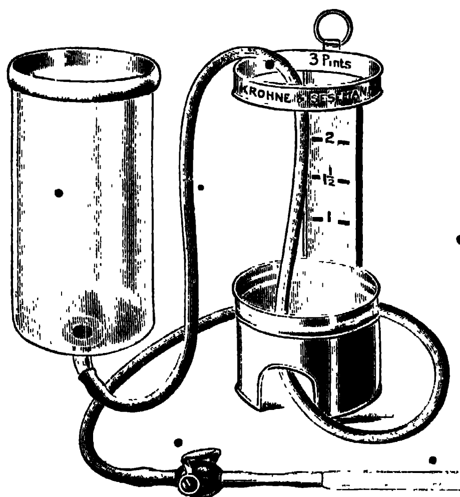
It is often an advantage in subacute or chronic cases to make applications to the vaginal mucous membrane, once or twice a week, through a Fergusson's speculum.

I have found the following method useful:—

Pass Fergusson's speculum, and pour in warm corrosive sublimate solution (1-1000). Manipulate the speculum (by partially withdrawing it, and passing it completely again) so that the fluid comes in contact with the whole surface. Pour off the sublimate solution, and apply a solution of sulphate of copper (10 per cent.) similarly. The patient uses vaginal injections herself in addition to this treatment.



Complete with tubing, stop-cock, and straight glass vaginal nozzle.



The glass receiver has been taken out of its metal stand.

FIG. 53.—HYDROSTATIC DOUCHE APPARATUS FOR GIVING VAGINAL INJECTIONS.

When the patient is to use it herself, it is necessary, as shown in the figure, to have a tap close to the glass vaginal tube.

While using an injection the patient should lie on her back with the hips somewhat elevated; if expense be no object, the ladies' bed-bath may be placed under her; otherwise an ordinary bed-pan may be used. The quantity of fluid injected should be at least a quart.

VAGINISMUS.

This name is given to a condition where painful spasm of the muscles round the vaginal orifice is set up by attempts at sexual intercourse. Coitus may thus be rendered either difficult, or impossible. Sometimes merely touching the vulva is sufficient to cause the spasm. In bad cases the spasm extends to the muscles of the body generally. Vaginismus may be either *primary* or *secondary*.

In *primary vaginismus* no local cause can be discovered to account for the condition. The disease is, in fact, a neurosis.

In *secondary vaginismus* some local cause is present.

On examination we find some one of the following conditions :—

Fissures in the neighbourhood of the vaginal orifice, *e.g.*, in the fossa navicularis.

An inflammation of part of the hymen.

A urethral caruncle.

Vulvitis, or vaginitis, or both.

Little ulcers round the vaginal orifice.

All these conditions may occur without causing vaginismus. It is only when the pain caused by touching the diseased part is so severe as to set up spasm of the muscles round the vaginal orifice, that we call the condition vaginismus.

The subjects of it are usually of an emotional temperament.

Treatment.—In secondary vaginismus we endeavour to remove the cause. Vulvitis, vaginitis, and urethral caruncle are to be treated as advised elsewhere. If there is a fissure, the patient should be placed under the influence of an anæsthetic, and the vaginal orifice forcibly dilated with the fingers, or by means of vaginal dilators. If little ulcers are present, they should be touched with the actual cautery ; this may cure them, but in some cases they reappear.

In all cases of vaginismus there is dyspareunia (pain on coitus) ; but dyspareunia is not, in all cases, accompanied by vaginismus.

In primary vaginismus full dilatation of the vaginal orifice

should be effected under anæsthesia. Subsequently, solid* glass vaginal dilators should be passed, a small size at first, and a larger one every few days till the largest size has been reached. The patient can be taught to pass them herself after a short time, always within a fortnight in my own cases. She should be told to continue the use of the dilators till all special sensitiveness at the orifice of the vagina has disappeared, which will probably be the case in six or eight weeks. After this there will generally be no further complaint as to dyspareunia. In several cases of this kind I have known the women had been married several years without coitus having occurred.

I have seen many severe cases of dyspareunia, accompanied by vaginismus, cured by dilating the vaginal orifice.

Subsequent to the treatment mentioned the normal relations of married life followed without any difficulty, and several of the patients have borne children.

TUMOURS OF THE VAGINA.

All tumours originating in the vagina are rare. The following may be met with :—

Cysts.

Cysts of the vagina may be of developmental origin and formed from part of Gartner's duct. Such cysts are found in the upper two-thirds of the vagina situated anteriorly and somewhat to the side. Occasionally a large cyst developed from the intra-cervical part of Gartner's duct, or, from the part of it running between the layers of the broad ligament, may be found to bulge into the vagina laterally. Large cysts of this kind should never be dealt with from below. The proper treatment is laparotomy and enucleation of the cyst, which may be found to have a pedicle formed of uterine tissue at one side of the cervix. I have recorded a case of this kind.† The walls of such cysts are lined by columnar epithelium.

Cysts may also arise from effusion of blood into the vaginal connective tissue, from the dilatation of lymphatic

* Supplied by Mayer & Meltzer.

† *Proc. Roy. Soc., Med.* (Obstet. Section), January, 1910, p. 67.

spaces, and when low down on the anterior vaginal wall (a situation in which cysts are most often found), they may be retention cysts arising from Skene's tubules, which lie in the floor of the urethra. They contain a clear yellowish fluid. Sometimes the fluid is of a brownish colour, suggesting that the origin of the cyst may have been an extravasation of blood.

Many years ago I saw a case where a cyst of the anterior vaginal wall, about the size of a duck's egg, was present as a complication of pregnancy at rather more than the eighth month; it projected outside the vulva. As it seemed not unlikely that it might occasion some trouble at the confinement, it was decided to treat it at once by incision and the application of pure carbolic acid to the lining membrane of the cyst. The interesting point is that this trivial operation seemed to bring about labour, as this came on two days afterwards. Both mother and child did quite well. The case shows that even the slightest operations on the vagina during pregnancy should be postponed, at all events, to a late period, when, if labour should come on, the child would be likely to survive.

Fibroid tumours of the vagina.—These are very rare. In one case I recorded * the tumour was situated (as they generally are) on the anterior wall.

Primary malignant disease.—Either carcinoma or sarcoma may affect the vagina. More frequently, when there is malignant disease of the vagina, it is secondary to malignant disease of the uterus.

Abscess of the vagina.—Abscesses due to a suppurative pelvic cellulitis, or a suppurating hæmatocele, often open into the vagina (see case of S. J., in Chapter XIV., for example). But the course of events there is plain. Here it is only intended to mention abscesses that have not originated, so far as can be ascertained, from any of the ordinary conditions causing pelvic abscess.

The following case will illustrate what is meant:—

Sarah G., aged 29, married twelve years, six children, the last born November 30, 1888; five miscarriages, the last three years ago; was

* *Trans. Obst. Soc. Lond.*, vol. xxix.

admitted into the London Hospital on January 30, 1889, on account of a tumour in the vagina.

At the last confinement but one the child was still-born, and at the last confinement the child only lived forty-eight hours. Chloroform was given on each occasion.

About four months ago she felt a lump about the size of an egg in "the front passage"; she says it came suddenly; she was standing up when she first noticed it; she experienced great pain at the time, and felt faint.

Her last confinement was an extremely difficult one; she was attended by Dr. Waller and Dr. Turtle, who found a lump in the passage obstructing the descent of the child.

Present state—Abdominal examination.—There is a hard body to be felt in the hypogastrium in the middle line about on a level with the brim of the pelvis. This was shown by subsequent examination to be the uterus.

Vaginal examination.—On inspection a convex smooth lump is seen just within the orifice of the vagina. It is found to lie beneath the mucous membrane of the posterior vaginal wall. The lump extends up almost as far as the finger can reach, forming a mass between the rectum and vagina at least 1 inch and a half thick. The lowest part of the tumour extends to within an inch of the vaginal orifice. Everywhere the vaginal mucous membrane over the mass has its normal colour.

The uterus can with difficulty be reached; it is very high up, and quite separate from the tumour, though pushed up by it. There are numerous cicatricial bands in the upper region of the vagina (no doubt due to the difficult delivery already referred to).

The lower end of the mass has some mobility, but the attached part is fixed. The tumour appears to spring from the right side of the pelvis between the vagina and rectum, and it reaches almost to the left side.

As regards consistence the lump is hard in parts, and in parts softer.

She gained 6 lb. in weight between February 7 and March 21.

On the latter date a trocar was inserted into the tumour (which was exactly in the same condition as first described), and about an ounce of yellow pus, free from any smell, came out.

On March 25.—A trocar was again inserted, and after two unsuccessful attempts, the abscess cavity was found. A director was now passed alongside of the canula, and a bistoury guided along it then made an opening large enough to admit the finger. Two yellow lumps about the size of half a walnut came out of the cavity, besides a small amount of pus. The lumps had the consistence of recent blood-clot, but they were yellow. The cavity having been washed out with iodine water, a drainage tube about three to four inches long was inserted, the lower end of the tube being stitched to the edges of the opening.

The wall of the abscess was remarkably thick, so that some difficulty was met with in actually reaching the cavity with the trocar.

The patient did quite well, and went out on April 27. I examined her in November, 1889; there was thickening in the position where the abscess had been. She was quite well in herself.

An abscess may also form occasionally between the anterior vaginal wall and the urethra; and it may open into the urethra. I have mentioned a case of this kind in Chapter XVIII.

Treatment.—Vaginal cysts having a definite cyst wall should be dissected out entire. Large vessels may be met with, particularly if the cyst is situated high up in the vagina. In dissecting out a cyst the size of a Tangerine orange from beneath the posterior vaginal wall, with some of its attachments high up near the cervix, I was obliged to leave several pairs of Wells's forceps on bleeding points for forty-eight hours. The case did quite well. Cysts large enough to be palpable on abdominal examination alone, even though bulging towards the vagina, should be dealt with by the abdominal route.

Vaginal cysts are also sometimes treated by cutting out a piece of the cyst wall, and applying pure carbolic acid, or tincture of iodine, to the interior of the cyst. It is much better, however, to dissect out the whole cyst.

Fibroid tumours may be dissected out entire, as in my case referred to above.

When there is reason to think that malignant growths found in the vagina are the primary and only ones present, and their situation is such as to admit of removing them completely, this may be done.

The operation required is complete removal of the vagina with the uterus. Personally, though I have seen many cases of primary malignant disease of the vagina, I have never found one where the stage of the disease afforded any hope of complete removal being possible.

CHAPTER VIII.

PROLAPSE OF THE VAGINA. PROLAPSE OF THE UTERUS.

Prolapse of the vaginal walls.—This is an exceedingly common condition. Either the anterior vaginal wall alone, or the posterior vaginal wall alone, may prolapse; or both may come down simultaneously.

Prolapse of the anterior vaginal wall is called *cystocele*, because the attachment of the bladder to the anterior vaginal wall is so intimate, that when the latter prolapses the bladder must descend at the same time.

Prolapse of the posterior vaginal wall may or may not be *rectocele*, because the attachment between the posterior vaginal wall and the rectum is not so intimate as that between the anterior vaginal wall and the bladder; it is possible for the posterior vaginal wall to prolapse without carrying a pouch of the rectum with it. When, however, there is an *extensive* prolapse of the posterior vaginal wall there is generally rectocele.

When the vaginal walls prolapse, more or less *secondary prolapse of the uterus* generally occurs as a consequence, as will be explained further on.

Prolapse of the uterus. Procidentia.—By this is meant that the uterus occupies a lower position than natural.

As regards degree, when the uterus has partly, or wholly, passed the orifice of the vulva, the case is called one of "*procidentia*."

When the uterus, though lower than normal, still lies wholly within the vagina, the case is one simply of *prolapse*.

When the uterus has descended so that the cervix is outside the vulva, the body of the uterus not being yet outside, the case is one of *partial or incomplete procidentia.*

When the whole uterus is outside the vulva lying in the sac formed by the inverted vaginal walls, the case is one of *complete procidentia.*

In cases of complete procidentia there is a mass, the size perhaps of a cocoanut, outside the vulva. The os uteri is seen somewhere near the middle of the mass, and the body of the uterus can be felt in the hinder half of it; often both ovaries can be made out as well (Figs. 54, 55 and 57).



FIG. 54.—COMPLETE PROCIDENTIA UTERI.

The external os uteri is well seen as a small depression towards the anterior aspect of the mass outside the vulva.

Etiology of prolapse of the uterus.—Suppose we compare the peritoneal cavity to an oval elastic bag, with the uterus attached to the wall at the lower part of the bag; then, on looking at the diagram (Fig. 56), it will be evident that any force acting in the direction of the arrow will tend to cause descent of the uterus. Now, the force acting in the direction of the arrow may be—

Increased weight of the uterus, due, for instance, to fibroid

tumours in its walls, or to subinvolution after labour; or it may be—

Traction on the uterus from below, as when the vaginal walls are prolapsed, and tend to drag the uterus after them; or, again, force in the required direction may be produced by—

Increase of the general intra-abdominal pressure, such as occurs in all acts of straining.

Obviously, any of these causes will act to greater advan-

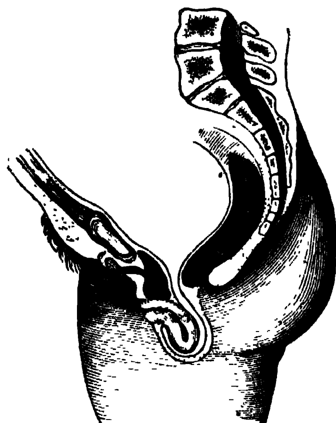


FIG. 55.—COMPLETE PROCIDENTIA UTERI (Schroeder).

Note.—1. The retroflexed position of the uterus; this position is the invariable rule, except when the uterus has been fixed in a position of anteflexion previously by adhesions. Practically the uterus is always retroflexed in cases of procidentia.
2. The complete inversion of the vagina
3. The position of the bladder.
4. The position of Douglas' pouch.

tage if the tissues round the uterus are in the lax condition natural to them after labour.

Rupture of the perineum only *facilitates* prolapse; it is not an exciting cause. The late Dr. Matthews Duncan compared descent of the uterus in cases of prolapse to descent of the head in the second stage of labour, after the os is fully dilated. In the latter case an intact perineum does not prevent the birth of the head; time only is needed, if there are good pains, for the perineum to stretch sufficiently to allow the head to pass; and so it is in cases of

prolapse of the uterus—an intact, unruptured perineum only delays the descent of the uterus; time is required for the perineum to stretch; but given this, it will do so, and the uterus pass out, just as the head does in labour: the motive power in the latter case being the uterine contractions; whereas, in cases of prolapse, it is some one of the three causes given above, as producing force in the direction of the arrow in the diagram.

Etiology of prolapse of the vaginal walls.—Similarly, rupture of the perineum only *facilitates* prolapse of the vaginal walls, the only essential *exciting cause* of their prolapse being *increased intra-abdominal pressure*, as, for example, during muscular efforts. Other predisposing causes of pro-

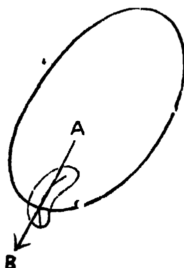


FIG. 56.

lapse of the vagina are, in the case of the anterior vaginal wall, an habitually full bladder, and, in the case of the posterior vaginal wall, an habitually overloaded rectum. Most cases of prolapse of the uterus are secondary to prolapse of the vaginal walls.

Symptoms and diagnosis.—The symptoms are often slight and unimportant; there is usually more or less "bearing-down" and feeling of weight in the pelvis.

But in extreme cases, where the whole uterus and its appendages lie outside the body in the inverted vagina, the patient often complains of little, except the inconvenience of having a big lump between her legs. As the late Dr. Matthews Duncan pointed out, this fact (which any one can verify for himself, as the cases are common enough) makes it very hard for us to believe that grave symptoms can be caused by comparatively slight displacements of the

uterus; for in this, which, with the exception perhaps of inversion of the uterus, is the greatest of all displacements, symptoms are usually so slight.

Some difficulty in emptying the bladder is another symptom often met with.

The patient has not uncommonly found out for herself that she can manage better when she presses the lump up. In many cases of prolapse there is often some slight incontinence of urine. In such cases a little urine comes away involuntarily on slight exertion; not unfrequently this symptom is the chief one from the patient's point of view. It is remarkable that in cases of procidentia, contrary to what we should expect, menstruation is not usually excessive.

As regards diagnosis, as a rule this presents no difficulty. When there is a moderate prolapse of the anterior vaginal wall, it might possibly be taken for a cyst or other tumour growing in the anterior vaginal wall, indeed I have known more than one instance in which this mistake has been made; but any doubt can at once be cleared up by passing a sound into the bladder, and being able to feel the point at every part of the swelling, with only the wall of the bladder and vagina between the sound and the finger.

In cases of procidentia, the presence of the os uteri makes the nature of the case at once evident. Often there are extensive ulcerations on the inverted vaginal walls from the friction against the clothes (Fig. 57).

On passing the sound into the uterus it usually passes a good deal farther than the normal distance, often four to five inches, or more. The elongation is partly due to hypertrophy of the uterus, but most of it is due to stretching of the supra-vaginal portion of the cervix.

The usual order of events in cases of procidentia has been, first, prolapse of the vaginal walls, which causes traction on the cervix at the vaginal reflection. Now the uterus does not descend freely under the influence of this traction; it is for a time held back by the broad ligaments, and utero-sacral ligaments. The result is that the uterus stretches, most of the elongation taking place in the supra-vaginal cervix. In time, however, the attachments above stretch to an

extent sufficient to allow the whole uterus and its appendages to lie outside the vulva. The only limit to the descent of the uterus is the degree to which the walls of the inverted vagina will stretch.

On this factor it depends whether, in cases of procidentia, the whole uterus lies outside, or only part of it; if the vaginal walls are short, so that, when completely inverted, the vagina forms a bag of little depth, and the uterus is large, the sound passing four and a half inches or more, then there will not be room for the whole uterus in the bag; if, on the other



FIG. 57.—COMPLETE PROCIDENTIA UTERI (Winckel).

The dotted line indicates the position of the body of the uterus. Note the somewhat crescentic ulceration on the vaginal wall posterior to the os uteri. The patient is lying on her left side. Similar ulcers may be found on the anterior vaginal wall also.

hand, the vaginal walls are long, or the uterus small, the bag formed by the inverted vagina will contain the whole uterus.

Treatment.—In slight cases, either of prolapse of the uterus, or of prolapse of the vaginal walls, a ring pessary of suitable size is all that is needed. In the case of the uterus it must first be replaced into the normal position before inserting the pessary. A ring, or other, pessary is less efficacious when the *posterior* vaginal wall prolapses than when there is cystocele (or prolapse of the anterior vaginal

wall) alone. In bad cases of prolapse of the vagina, or in cases of procidentia, a ring is not usually retained. The condition that must be satisfied for a ring pessary to suit the case is, that the vagina be narrower below than it is above; if, either on account of rupture of the perineum, or by stretching of an unruptured perineum, it has come about that the vagina is as capacious below as it is above, it practically forms a cylindrical cavity, like a cylindrical jar open at the bottom, and a ring that will just go easily into the top has nothing to prevent it falling out at the bottom. It will be noticed, when a ring is being inserted, that it is compressed, so as to pass it by artifice through the narrow



FIG. 58.—Ring pessary, made of watch-spring covered with india-rubber. In the figure it is seen compressed between the finger and the thumb, as when about to be introduced. It is important to keep it compressed till it has passed the orifice of the vagina, and also to pass it well backwards. A ring pessary may be left in for three months at a time, the patient using douches night and morning.

vaginal orifice; now, so long as the vagina is normally capacious above and narrow below, force has to be exercised to make it come out, force that either compresses the ring, or dilates the orifice; if no such force is in operation, or if the force in operation is insufficient, the ring is retained, and keeps up the prolapsed parts. Hodge's pessary is sometimes used for prolapse. It is only suitable where the uterus is slightly prolapsed without prolapse of the vaginal walls. When there is prolapse of the vagina, the walls of the latter are generally so relaxed, and the vagina so capacious, that Hodge's pessary is useless.

In some cases of slight prolapse of the vaginal walls, especially in old women, *the cradle pessary* (originally invented

by Graily Hewitt for anteflexion) is more suitable than the ring pessary or Hodge's pessary.

For those cases in which a ring pessary or Hodge's pessary is useless, Zwanke's pessary, sometimes known as the "butterfly" pessary, may be tried. It is well not to

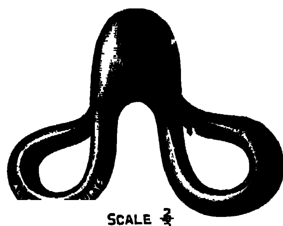


FIG. 59.—GRAILY HEWITT'S CRADLE PESSARY.

use it if a Hodge's pessary or a ring pessary will suit the case, because its use is not free from risk. It must be taken out daily by the patient. If this is not done, ulceration of the vaginal walls is not unlikely to occur as a result of pressure. The ulceration may be so extensive as to produce



FIG. 60.—ZWANKE'S PESSARY, OPENED OUT AS WHEN IT LIES IN THE VAGINA.

To take it out, the "wings" are approximated by turning the screw at the lower end.

a vesico-vaginal fistula. Still, with proper precautions, Zwanke's pessary is certainly capable of relieving many cases where Hodge's pessary and the ring pessary have failed.

In still more severe cases of prolapse, where neither Hodge's pessary, nor a ring pessary, nor Zwanke's pessary

is efficacious, the patient may try a cup and stem pessary (Fig. 61), which takes its support from a waist-belt. Some patients obtain a fair degree of comfort with this. Others, however, find the bands very uncomfortable, and apart from this a cup and stem pessary often fails to keep the parts up properly.

In cases therefore which are not adequately relieved by a ring pessary, operative treatment is desirable, unless there is some special contra-indication.

The mildest operative procedure is an operation to restore the original shape of the vagina—that is to say, to make it once more narrow below.

This may be sufficient in some cases, especially if a

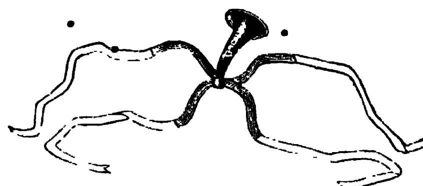


FIG. 61.—CUP AND STEM PESSARY (VULCANITE), WITH BANDS FOR ATTACHING TO THE WAIST-BELT, SEEN IN THE NEXT FIGURE.

The patient takes out this pessary at bedtime, and washes it, replacing it in the morning when she gets up.

portion of the cervix is at the same time removed, should it be much hypertrophied, as is often the case.

In other cases the result will not be completely satisfactory unless the uterus is subsequently suspended in its proper position by some one of the operations to be described later.

If the particular circumstances of the case, such as advanced age, or the like, make an abdominal operation undesirable, and the patient has not obtained complete relief by the operation on the vaginal walls, she may wear a ring pessary of suitable size. She will now be able to retain the pessary as the result of the colpo-perineorrhaphy.

I have had many patients with procidentia, treated in this way, remain comfortable for several years.

Colporrhaphy.—The operation on the vagina referred to is a combined anterior and posterior colporrhaphy with re-

storation of the perineum. The patient being in the lithotomy position, an oval piece of mucous membrane is marked out on the anterior vaginal wall. The long axis of the oval is from the cervix to the urethra, but the lowest limit of the mucous membrane to be dissected off is about ½ inch from the urethral orifice, and the highest limit is about an inch below the cervix. The flap marked out is then dissected off. After this has been done, it is an advantage, as advised by Dudley and others, to strip the bladder back at the periphery of the oval from the vaginal wall for about ½ inch, and also to strip

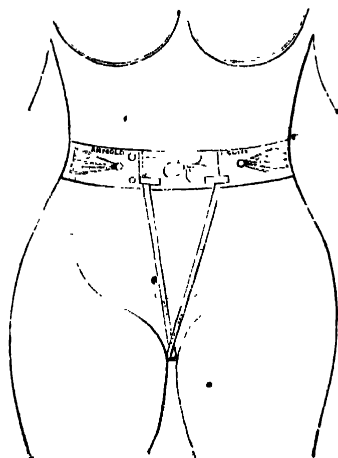


FIG. 62.—The waist-belt, with the bands seen in the preceding figure fastened to it. Two fasten behind, and two in front; only the last two can be seen in the figure.

it up from the anterior aspect of the cervix as far as the vesico-uterine pouch. The flaps of vaginal wall so raised are brought together by mattress sutures from side to side. Chromic gut sutures are used. This is anterior colporrhaphy. If thought necessary, about half the cervix may now be removed; the line of section is in the supra-vaginal cervix. The steps of the operation are described under Cancer of the Uterus. The posterior colporrhaphy is done last. To perform it a triangular piece of mucous membrane is removed from the posterior vaginal wall. The base of the triangle is, of course, at the junction of the posterior vaginal

wall with the skin of the perineum, and the apex is high up the posterior vaginal wall, not far from the cervix. Stitches are then passed so that the raw surface A B D is in apposition with the raw surface A C D. There are many different methods of suturing by which this result may be obtained.

At the lower deeper part of the wound near the rectum the lateral raw surfaces are best united by interrupted sutures of chromic gut. At the upper part of the triangle sutures may be passed from the cut edge of the mucous membrane on each side completely under the raw surface.

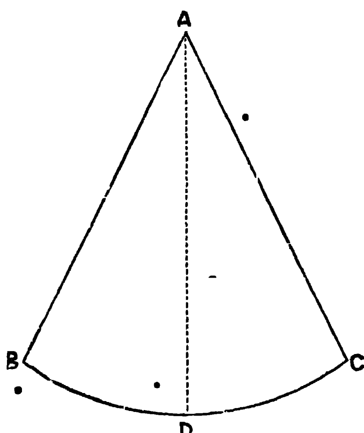


FIG. 63.—Diagrammatic representation of raw surface to be made on the posterior vaginal wall in the operation of posterior colporrhaphy.

As the lower half of the triangle is approached, interrupted buried sutures are best, as mentioned above. Often a buried figure of 8 suture can be usefully employed. Chromic gut sutures are used throughout. The operator must use his own judgment as to how many sutures are required to obtain the desired result—namely, good apposition of one half of the triangle (Fig. 63) to the other. I prefer myself to use two or three deep silkworm-gut sutures for the perineum, tied on the skin surface. The effect will clearly be a considerable narrowing of the lower half of the vagina, and a restoration of the perineum.

The size of the raw surface to be made in either anterior

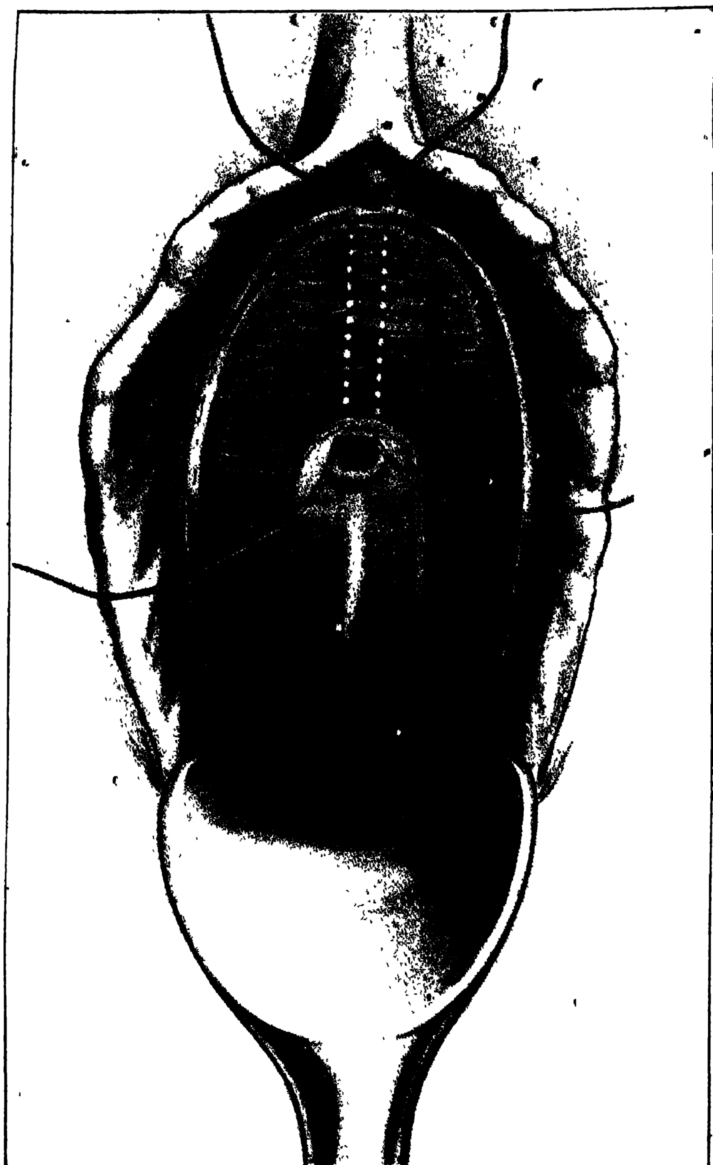


FIG. 64.—DUDLEY'S OPERATION FOR INCONTINENCE OF URINE IN CASES OF PROLAPSE.*
Raw surface made, and first two sutures passed ready for tying.

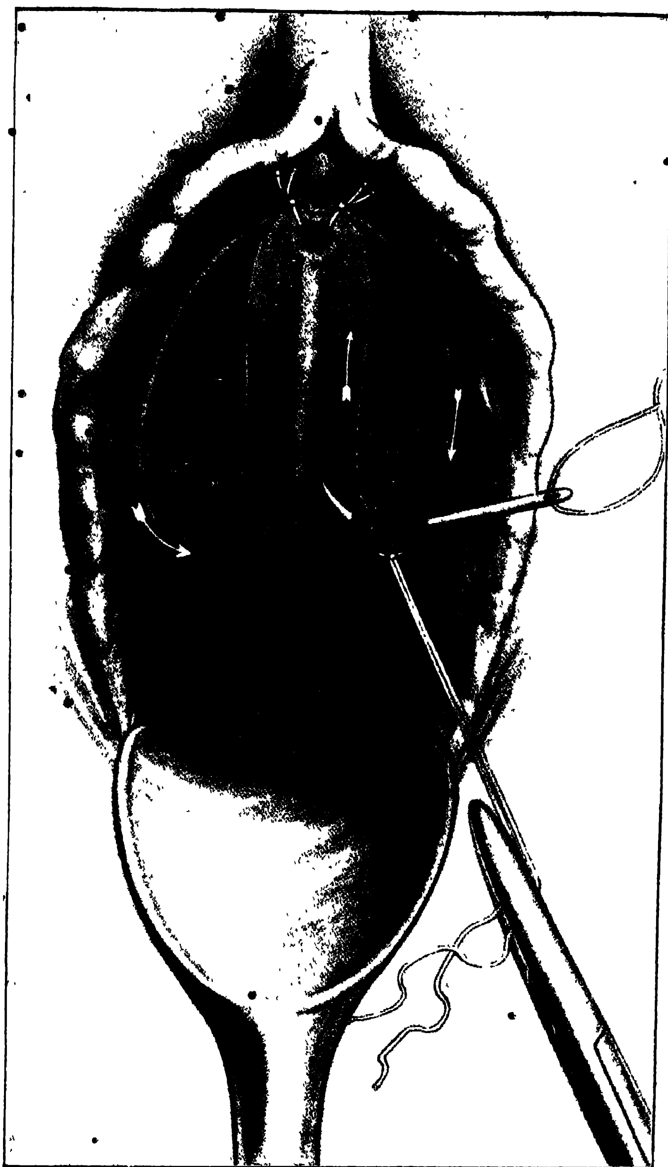


FIG. 65.—DUDLEY'S OPERATION FOR INCONTINENCE OF URINE IN CASES OF PROLAPSE.

The first two sutures tied: urethral orifice brought up close to the clitoris.

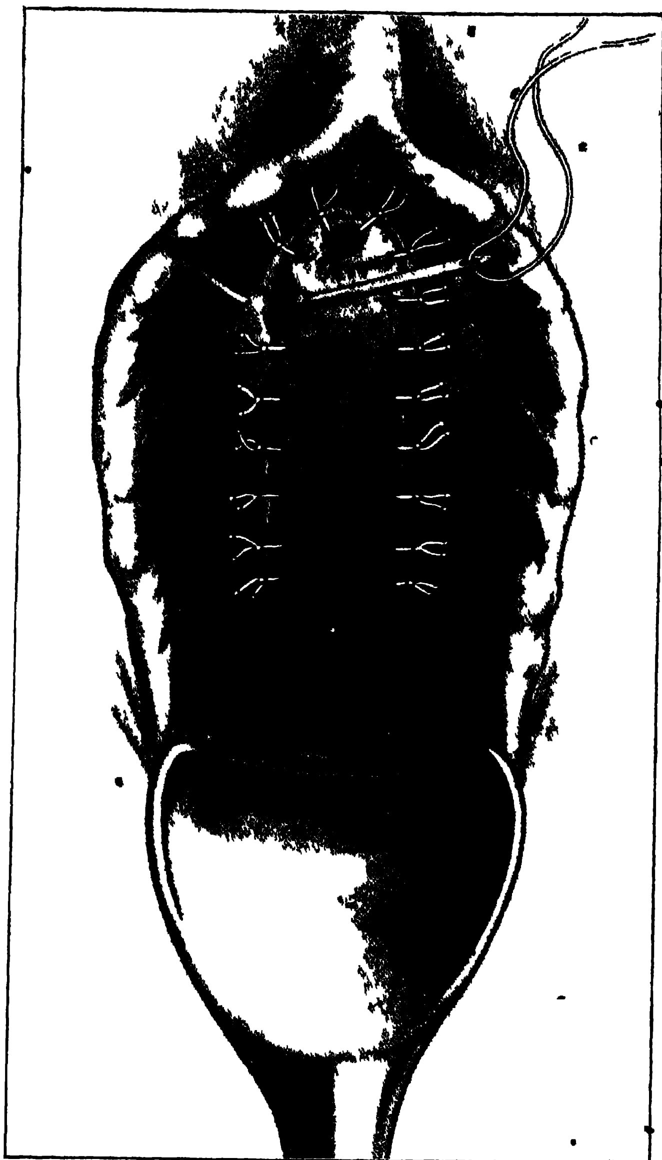


FIG. 66.—DUDLEY'S OPERATION FOR INCONTINENCE OF URINE IN CASES OF PROLAPSE.

The last suture is being passed; all the others to cover in the lateral raw surfaces have been tied.

or posterior colporrhaphy depends of course on the extent of the prolapse of each vaginal wall respectively.

When, besides the prolapse of the vagina, the patient complains of slight incontinence of urine as well, Dudley's operation for this should be performed in addition to the ordinary colporrhaphy. In Fig. 64 is shown a horseshoe-shaped raw surface; in the middle line it extends from the clitoris to the urethral orifice, but the ends of the horseshoe are prolonged some distance behind the urethra along the anterior vaginal wall on each side. In Fig. 64 the first two sutures are shown inserted ready for tying. In Fig. 65 these are shown tied; the effect is to pull up the urethra close to the clitoris. In Fig. 65 sutures are being passed to close the lateral raw surfaces. In Fig. 66 the last of these sutures is being passed, and all the others have been tied.

Operations for Fixing or Suspending the Uterus in Good Position after Laparotomy.

In cases of marked retroversion, which, as already pointed out, necessarily involves some degree of prolapse or descent of the uterus, and in cases of marked uterine prolapse (procidentia), many operations have been devised with the object of fixing, or suspending the uterus in approximately the normal position, after abdominal section. Thus the fundus has been sutured to the abdominal wall by sutures passed transversely through the deep fascia of the abdominal wall, then through the uterine tissue and through the deep fascia on the opposite side of the abdominal wound. When such sutures are tied, the fundus is fixed to the abdominal wall in the neighbourhood of the lower end of the usual median abdominal incision. The sutures through the uterus have sometimes been passed through the posterior wall near the fundus, sometimes through the anterior wall. All operations involving fixation of the uterus are open to serious objection—more especially when the fixation sutures have been passed through the posterior wall. When the uterus is thus artificially fixed, there is apt to be irritability of the bladder. As the bladder fills, the moderate retroversion, that then occurs physiologically, cannot take place if the uterus is fixed to the

abdominal wall in approximately its normal position. The so-called "normal position"—one of anteversion and slight anteflexion—*is only normal when the bladder is empty. A moderate degree of retroversion is equally normal when the* bladder is full. . . . .

Again, if the uterus is artificially fixed to the abdominal wall, should pregnancy occur, the uterus may be unable to rise upwards in the abdomen as it should do under normal conditions. This interference with its mobility may cause severe pain, and even miscarriage may result. Further, supposing pregnancy goes to term, if the posterior wall of the uterus has been sutured to the abdominal wall, the enlargement upwards required by pregnancy may take place chiefly at the expense of the posterior uterine wall, while the the anterior wall, much hypertrophied, remaining below, may form a tumour obstructing labour, and possibly even necessitating Cæsarean section.

Again, fixing the uterus to the abdominal wall produces an impediment within the peritoneal cavity, just as a large broad pillar would do in a room. The free movement of the intestines within the peritoneal cavity must be impeded by the presence of such a pillar, and, in certain conditions of distension of the bowel and constipation, a pseudo-obstruction, or even an actual intestinal obstruction may occur.

The same objection applies, but with less force, to Kelly's operation for suspending the uterus by sutures passed through its anterior wall near the fundus, and through the peritoneum and subperitoneal fat only, near the lower end of the abdominal wound. In this operation the fundus only remains in contact with the abdominal wall for a time. Being attached there by peritoneum only, the adhesions at the point of attachment stretch, and then leave the uterus suspended by an adhesion of greater or less length to the anterior abdominal wall. The object aimed at in the operation—namely, to get the uterus into a fairly normal position—is only temporarily attained. When the adhesions have stretched a good deal as described, the uterus lies again at a lower level, and much or all of the original effect of the operation has been undone.

The peritoneal "sling" between the abdominal wall and

the fundus uteri is also a variety of the pillar mentioned above, and is open to the same objections, though the risk of trouble in this case is certainly much less than when the uterus is immovably sutured to the abdominal wall.

For my own part, I regard all operations in which the uterus is directly fixed or suspended to the abdominal wall as unsafe. Many who take this view have shown much ingenuity in devising operations which will hold the uterus up indirectly. Alexander's operation, for instance, is one for shortening the round ligaments, and so holding the uterus up. In this operation the round ligaments are found (without opening the abdominal cavity) by dissection in the groin. Among operations involving laparotomy is Gilliam's. In this operation, after the abdomen has been opened, the round ligament is pinched up at a suitable distance, say 2 inches in front of the uterus, and a stout ligature is tied round it. A pair of curved forceps is then passed transversely outwards under the anterior aponeurosis of the abdominal wall till it is outside the rectus ; it is then made to pierce the peritoneum so as to appear on the under surface of the abdominal wall. The ligature tied to the round ligament is then put into the forceps, and the latter is withdrawn so as to pull the ligature up through the peritoneum, under the aponeurosis, and out at the middle line of the wound, carrying a loop of the round ligament with it. The same thing is done on the opposite side. The loops of round ligament so drawn into the abdominal wound are sutured there each to the aponeurosis of the opposite side. The result is to pull the uterus upwards and forwards, and keep it there. It seems to me that in this operation the effect also is to produce two "pillars" in the abdominal cavity, one on each side, where the round ligaments come through the artificial opening in the peritoneum ; and therefore the operation appears to be open to the same objections as fixation of the uterus, only the more so, inasmuch as by it two "pillars" are produced within the abdominal cavity instead of one. It seems possible also that a space may be left between each "pillar" and the corresponding groin on each side : if this occur, the effect is to produce a foramen in the position indicated ; a possibility therefore exists of partial or even complete intestinal

obstruction. Dudley's modification of this operation avoids the formation of any "pillar," and is to be preferred. (See Plates IV. and V. at end of this chapter.)

Slinging the uterus.—The only abdominal operation, with the exception of Dudley's, just referred to, which appears to be completely free from the production as a necessary consequence of "pillars" or "compartments" in the peritoneal cavity is one by which the round ligaments are shortened to the necessary extent to bring the uterus into good position *within* the peritoneal cavity. This may be done by simply folding a loop of the round ligament back



FIG. 67.—SLINGING THE UTERUS (Clarence Webster).
A loop of round ligament has been drawn through a hole in the broad ligament, and sutured to the back of the uterus on each side.

on itself, and stitching the loop to the main trunk of the round ligament on each side. The method I prefer, however, is the one described by Clarence Webster,* and also more recently by Blair Bell. In this operation the uterus is held up, and a clear space in the broad ligament near the uterus and a little below the ovarian ligament, free from vessels, is located. A pair of sinus forceps is thrust through, and opened so as to make a small hole in the broad ligament. A stout silk ligature has been previously passed under the round ligament about 2 inches from the uterus, and tied ; this

* "Diseases of Women," 1907, p. 487.

silk ligature is now carried in forceps through the hole in the broad ligament, and pulled through, carrying with it a loop of the round ligament. This loop is stitched to the back of the uterus. When this has been done on each side, the uterus is slung up in approximately a normal position.

This operation, at all events, produces neither "pillars" nor "compartments" within the peritoneal cavity, and therefore seems to be free from any risk of causing intestinal obstruction. It also leaves the uterus with a fair degree of mobility. I have so far been well satisfied with this operation myself.

Indications.—In cases of retroverted uterus causing symptoms, where the uterus cannot be kept in place by a pessary, or in similar cases where the patient objects to wearing a pessary.

In cases of severe prolapse (procidentia) as a complement to anterior and posterior colporrhaphy, which in such cases should be performed first.

TABLE SHOWING THE ETIOLOGY OF PROLAPSE OF THE UTERUS AND PROLAPSE OF THE VAGINAL WALLS.

Prolapse of the uterus.

Exciting cause.—Force acting in the direction A B in the diagram, page 144, which may be either:—

1. Increase of the general intra-abdominal pressure.
2. Traction from below, as by the prolapsing vaginal walls.
3. The weight of an abnormally heavy uterus.

Predisposing causes:—

Rupture of the perineum.
Relaxation of the soft parts by recent labour.
Absorption of fat from the soft parts in the pelvis in old age.
Laborious employments, chronic cough, &c.

Prolapse of the vaginal walls.

Exciting cause.—Increase of the general intra-abdominal pressure.

Predisposing causes :-

Habitually full bladder (the presence of a small ovarian tumour acts similarly; see Chapter XVI, for an instance of this).

Habitually loaded rectum, in addition to the predisposing causes of prolapse of uterus given above.

PLATE IV.



PLATE V.



CHAPTER IX.

DISEASES OF THE UTERUS.

INFLAMMATION.

Cervical endometritis. Corporeal endometritis.—Inflammation may affect the mucous membrane of the cervix only, when it is known as *cervical endometritis*; or it may affect the mucous membrane of the body of the uterus, and it is then called *corporeal endometritis*.

CERVICAL ENDOMETRITIS.

Etiology.—The essential cause of both cervical and corporeal endometritis is infection by some micro-organism, as in the case of vulvitis and vaginitis. A list of the principal micro-organisms concerned has been already given in the account of vulvitis and vaginitis, and need not be repeated here. This disease in much commoner in women who have had children than in nulliparæ, the starting-point in most cases being injuries inflicted on the cervix during labour accompanied by septic infection. In such cases the whole thickness of the cervix is necessarily more or less involved in the inflammation, whereas, in the cervical endometritis of nulliparæ, the inflammation is more strictly limited to the mucous membrane.

Predisposing causes are those which predispose to inflammation of mucous membranes in other situations, such as the strumous, rheumatic, or gouty constitution. In the same category may be placed exposure to cold, especially during a menstrual period.

Exciting causes are :—

1. *Septic infection*, either during labour, or at some other time, by the use of instruments, the sound, tents, &c.

2. *Gonorrhœal infection* during coitus. The primary

infection often occurs then at the external os uteri, and affects the cervical mucous membrane throughout.

3. *Extension* from vaginitis.

While there is no doubt that this extension occurs, it is very striking to observe how a purulent vaginitis will sometimes remain strictly limited to the vagina, the secretion in the os uteri remaining typically healthy; and this, although the vaginal portion is lying constantly in a pool of pus.

Symptoms.—The only essential one is the presence of *a discharge* * which attracts the patient's attention. There may be many other symptoms present in the case due to associated morbid conditions, but the only symptom caused by the cervical endometritis itself is a discharge.

Normally, the secretion of the cervical glands is clear and viscid, like unboiled white of egg; when there is cervical endometritis, this secretion changes its character, and becomes either (*a*) opaque and white, in cases of slight catarrh; or (*b*) opaque and yellow, if the inflammation is more severe.

Diagnosis.—This is made by passing a speculum, and observing the character of the secretion *within* the external os. Often some opaque-white viscid discharge will be seen *in the vagina*, when the secretion just within the external os is healthy, *i.e.*, transparent. It seems to be the case that when the healthy secretion of the cervical glands lies in the vagina it becomes opaque. Our diagnosis of cervical endometritis rests on the kind of secretion actually within the external os. If this be opaque and white, there is catarrh of the cervical mucous membrane; if opaque and yellow, the inflammation is more severe.

If the thickness of the cervix is much involved in the inflammation, the finger notices increased size of the vaginal portion, and, in chronic cases, induration of it. Little prominences, the size of shot, are often to be felt not only immediately around the external os, but also on the vaginal

* The term "leucorrhœa" is often used in describing this symptom. Etymologically, of course, it ought to mean a white discharge, but practically it has come to be used rather loosely, and to mean a white or yellow discharge. It is better, therefore, not to use it, but rather the English adjective describing the actual discharge

portion at some distance from the os. Through the speculum these are seen to have a pearly-grey colour. They are little retention cysts, and are called *ovula Nabothi*; their origin will be considered further on.

Erosion of the cervix.—In many women the speculum shows a red, slightly depressed area, of greater or less extent, immediately round the external os. This was formerly called "ulceration" of the cervix, and was vigorously treated with various remedies. It must be admitted that such areas are deviations from the normal type.

Erosions are to be regarded as due to an extension of the glandular epithelium, normally situated entirely in the cervical canal and ceasing at the external os, beyond the external os, and for a variable distance over the adjoining surface of the vaginal portion. They are not therefore due to inflammation.

Of course, it may easily happen that cervical endometritis (due, as we have seen, to infection) may affect a cervix where a more or less extensive erosion has previously existed. But the etiology of the two conditions is essentially different.

Erosions are very commonly observed in cases in which the secretion within the external os is quite transparent, and therefore healthy.

In themselves erosions are of little or no practical importance; and, if uncomplicated by cervical endometritis, require no treatment.

Pathology of erosions.—Normally, the cervical canal is lined by a single layer of cubical epithelium (ciliated on the summits of the ridges, but not in the depressions between them). The epithelium maintains this character till within a line or two of the external os. The epithelium immediately round the external os is squamous and stratified. Further, it is necessary to remember that while there are numerous racemose glands opening into the cervical canal, there are no glands on the vaginal surface of the vaginal portion. When an erosion exists, however, we find that over the area occupied by it there is only a single layer of cubical epithelium, in place of the several layers of squamous epithelium normally found round the external os. This cubical epithelium is similar in appearance and function to that lining the cervical canal.

Varieties of erosion.—These are :—

1. *The simple.*
2. *The papillary* or *villous.*
3. *The follicular.*

1. *The simple* is that variety where the surface of the erosion is only slightly granular.



FIG. 68.—PAPILLARY EROSION (Schroeder).

2. *The papillary* is that where the epithelium dips down rather deeply, so as to make the surface more or less villous (Fig. 68).

3. If the entrance to the depressions between the papillæ

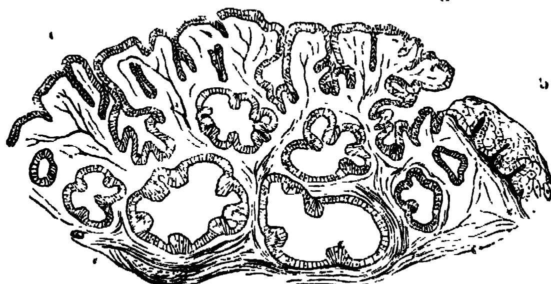


FIG. 69.—FOLLICULAR EROSION (Schroeder).

becomes obliterated; closed cavities are formed ; these may become distended by the secretion of the epithelium which, as just now remarked, takes on glandular functions, and the retention cysts resulting may burst. There is then *a follicular erosion* (Fig. 69).

EVERSION OF THE CERVICAL MUCOUS MEMBRANE.

When the vaginal portion of the cervix has been deeply lacerated during labour, the lips of the cervix gape, and expose the cervical mucous membrane. The greatest degree of eversion is reached when there has been laceration on both sides of the cervix reaching up to the vaginal reflection. The exposed mucous membrane is red, and the appearance presented is very similar to that of a rather extensive erosion. Its true nature will be recognised, first, by noticing with the finger that there has been laceration. Suppose, for example, that there has been a deep laceration on the left side (the

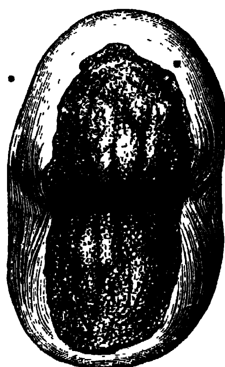


FIG. 70.—BILATERAL LACERATION OF THE CERVIX WITH EVERSION OF THE CERVICAL MUCOUS MEMBRANE (Schroeder).

most usual position, on account of the frequency of the first vertex presentation), then the finger, placed in the situation of the external os and adjoining part of the cervical canal, finds nothing between it and the vaginal wall on that side. Secondly, we may draw together the gaping lips of the cervix with two hooks, using a Sims' speculum, and find that the apparent erosion has disappeared, if it was all eversion; but if there was erosion as well as eversion, then that the extent of the red surface exposed has greatly diminished.

The everted cervical mucous membrane is often in a state of chronic inflammation, and consequently in such cases there is a white or yellow discharge. As a rule, laceration of the cervix in itself causes no other symptom except this

discharge. I have, however, seen some cases where it seemed probable that repeated miscarriage was due to the presence of an extensive laceration of the cervix. It is not unreasonable to believe there may be the relation of cause and effect in some of these cases, especially where the laceration is extensive. Normally, when no laceration of the cervix exists, the lowest part of the ovum in the neighbourhood of the internal os uteri is separated from the vagina by the whole length of the cervix. This no doubt acts as a buffer, and protects the ovum from shocks during exertion, lifting weights, &c., and also from the impact necessarily occurring during coitus. When the cervix has been deeply lacerated, particularly when the laceration is bilateral, this protecting buffer is more or less absent, and in women predisposed to miscarry its absence may be sufficient to determine miscarriage. Therefore, when there is a history of repeated miscarriages, it is desirable to repair the laceration by a plastic operation called trachelorrhaphy. Similarly, if the patient complains of a discharge which is found to be due to the laceration, this operation should be performed.

The area corresponding to the original laceration is made raw by dissecting off a thin layer of mucous membrane. The dissection must be carried well up into the angle of the laceration. Then the freshened surfaces are brought together by silkworm-gut sutures, which may be conveniently fastened with Aveling's coils and shot. In this way the original form of the cervix is restored. The sutures are taken out in ten days.

Treatment of cervical endometritis.—We pass Fergusson's speculum, and then ascertain the exact direction of the cervical canal with the sound. A solution of sulphate of copper * is then poured into the speculum, so as to cover the vaginal portion ; next we pass through the fluid a Playfair's probe, thinly dressed with wool, several times up and down the cervical canal, not passing it farther than the internal os. The wool on the probe takes up some of the solution each time ; the first time or two the copper solution thus carried up acts on the secretion in the

* The strength of the solution recommended is ℈ij. sulphate of copper to ℥j. water.

cervical canal, coagulating it, and so rendering it easy to remove; afterwards any more of the solution introduced acts on the cervical mucous membrane laid bare by the coagulation and removal of the secretion previously in the canal. The ordinary method of exposing the cervix as before, then removing the secretion in the cervical canal with a series of Playfair's probes dressed with dry wool, and then applying some remedy, *e.g.*, pure carbolic acid, or tincture of iodine, to the canal, is less satisfactory, because it is very difficult by simple mechanical means to remove the viscid secretion completely, and to ensure the remedy reaching the mucous membrane.



FIG. 71.
PLAYFAIR'S PROBE.
Absorbent wool is wrapped tightly round the terminal inch or so: the probe is then ready for use.

Argyrol solution, 20 per cent., is another remedy well spoken of in the treatment of cervical endometritis. It is applied by means of a Playfair's probe after the discharge in the cervical canal has been removed as completely as possible. Such applications as have been described should be made twice a week for a time, and the patient should use hot antiseptic vaginal douches night and morning as well.

If this treatment does not succeed, a specimen of the discharge actually within the os uteri should be taken on a sterilized platinum wire, and the wire placed at once in a culture tube containing a suitable culture medium. The tube is plugged with sterilized wool, and sent to a bacteriologist for investigation. In some cases, after the organism has been identified and cultivated, a vaccine can be prepared. Treatment by hypodermic injections of this vaccine may be tried in cases incurable by other means. This special form of treatment would seem to be best undertaken by

an expert bacteriologist. It is still in the experimental stage.

It may be added, that though cervical endometritis is regarded by some as a cause of sterility, it has probably little influence in this direction. It is a common experience to find patients becoming pregnant in whom we know there is a cervical endometritis. Considering how often labour is the starting-point of the disease, we may take it that, if cervical endometritis caused sterility, it would be rather a rare thing to find a woman who had had more than one child.

CORPOREAL ENDOMETRITIS.

Etiology.—Inflammation of the mucous membrane of the body of the uterus is due to infection, as already mentioned.

Corporeal endometritis may arise in connection with:—

Labour or abortion, especially if some parts of the ovum or clots are left behind.

Direct injury, *e.g.*, by the sound, or other instrument, such as intra-uterine stem pessaries, or tents, if any of these are insufficiently sterilized.

Intra-uterine growths.—Submucous fibroids, or mucous polypi.

It may arise by extension from inflammation lower down.

Endometritis may also occur in the course of *certain specific fevers.*

Old age may be regarded as a predisposing cause. At all events a form of corporeal endometritis occurs not infrequently in old women, and for want of a better name is known as *senile endometritis.*

Diagnosis.—It is often impossible to say whether or not there is corporeal endometritis in any particular case. When really present, it causes a discharge, white or yellow, according to the severity of the inflammation, but we only see this as it comes from the external os, and, therefore, we cannot be sure that it does not come from the cavity of the cervix only.

Certain features in the case may, however, incline us to

the opinion that there is corporeal endometritis. These are:—

1. A history of menorrhagia.

2. On bimanual examination finding the body of the uterus somewhat enlarged, and perhaps tender.

3. Finding that the sound *passed gently* causes much more pain than usual, and that perhaps a blood-stained discharge follows its withdrawal.

4. The discharge is much less viscid in endometritis of the body of the uterus than in cases where the inflammation is confined to the cervical canal.

All these, taken together, point to inflammation involving the mucous membrane of the body of the uterus.

In some few cases we can make the diagnosis certain by exploration of the cavity of the uterus with the finger, after, if necessary, dilating the cervix.

The following case is an example of what used to be called villous or fungous endometritis. This condition is, however, probably not really an inflammatory one at all, but one of localized overgrowth of the mucous membrane of the body of the uterus—innocent in character:—

CASE I.—M. W., aged 35. Married sixteen years; twins a year after marriage; two miscarriages, the last eleven and a half years ago. Admitted to the Hospital on account of menorrhagia of fifteen months' duration. She had been under my care in the out-patient department, but had obtained no relief. On examination the uterus was found to be enlarged, and the sound passed four inches. The uterus was freely movable. The vaginal portion of the cervix was healthy. The cervix was rapidly dilated under ether with Hegar's dilators. On passing the finger into the body of the uterus, soft, irregular projections, particularly extensive on the right side, were met with. These were thoroughly scraped away with a blunt-edged spoon, and tincture of iodine applied to the interior of the uterus. Portions of the substance removed, on microscopical examination afterwards, showed a glandular structure; very large irregularly shaped cavities lined with columnar epithelium, in a single layer, were seen in the sections. The temperature after dilatation remained normal. I have seen this patient at intervals since; she is now regular, and does not lose too much.

CASE II.—S. J., a Jewess, admitted into the London Hospital in labour, ineffectual attempts at delivery having been made outside. Had been in labour from half-past two on the afternoon of May 12, 1886, till six p.m. on the evening of the 13th, when I saw her. The ring of the Bandl could be felt a hand's breadth above the pubes. Fœtal

heart not heard. Forceps having failed, delivery by perforation and cephalotripsy.

May 31.—Ever since delivery there has been a lump to be felt reaching up to the umbilicus, at first of course taken to be the uterus, but latterly, as the patient had had more or less fever ever since the confinement, thought to be due, in part at least, to inflammatory exudation. To-day patient was examined on the couch, and it was then found

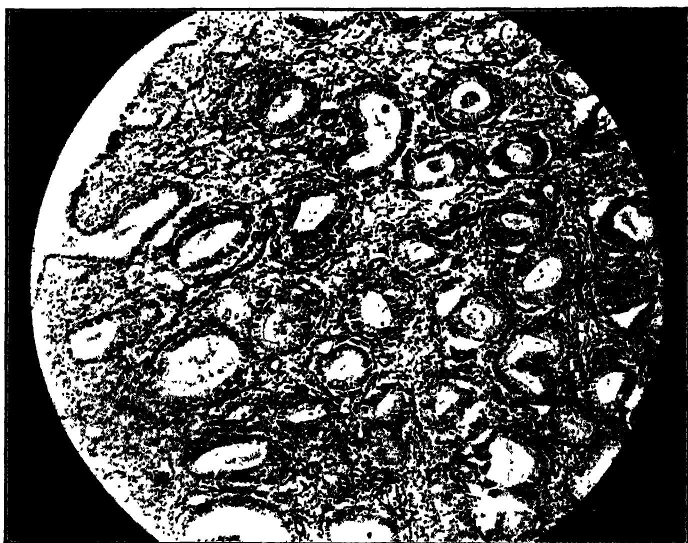


FIG. 72.—VILLOUS ENDOMETRITIS. (*Micro-photograph.*)

Hyperplasia of endometrium.—The glandular tissue is increased relatively to the stroma. A gland is seen opening on the free surface of the endometrium. Some of the glandular epithelium has shrunk from its basement membrane. Red corpuscles occupy the centre of many of the lumina. The interstices of the interglandular stroma are packed with red cells, which have escaped from dilated capillaries.

Clinical note.—The patient from whom the section was obtained was a married woman aged 43. Five children, the last seven years previously. Regular till a year before admission. Since then catamenia excessive and too frequent. The cervix was dilated, the endometrium curetted, and fuming nitric acid applied to it. Result good.

that a large sound could be passed up to the highest point of the tumour in the abdomen, going in $5\frac{1}{4}$ inches, thus showing the tumour to be the body of the uterus. The uterus was then washed out with carbolic lotion; the fluid that returned first was very foul.

June 13.—To-day a yellow, leathery mass, having an intensely fœtid odour, two inches long by one broad, was found hanging from the cervix; it was twisted off with cervix forceps.

June 24.—The uterus still being much about the size it was on May 31,

and the patient's general condition unsatisfactory, fever still persisting, she was put under an anæsthetic, and the interior of the uterus thoroughly scraped with a Récamier's curette. Numerous yellow flakes, intensely offensive, about $\frac{1}{16}$ inch in thickness, were removed, perhaps altogether enough to fill two or three tablespoons.



FIG. 73.—RÉCAMIER'S CURETTE.
Useful when a blunt instrument is required for scraping.



FIG. 74.—SHARP CURETTE.

From this time she improved rapidly, her highest temperature, on June 27, being 100°, and from that time on quite normal.

By July 14, just three weeks after the scraping, the uterus had involuted to its ordinary size, and the sound passed the normal distance. The uterus was freely movable.

This case illustrates endometritis of the body of the uterus dating from labour, and also the effect that a morbid condition of the endometrium may have in delaying involution of the uterus. It is not certain whether the yellow, leathery, offensive masses referred to were entirely clots, or whether they may not perhaps have been partly sloughs from the interior of the uterus, due to damage received in the very long labour. The membranes had been ruptured, and the os fully dilated, at least eighteen hours.

Foreign bodies in the uterus.

These are of rare occurrence, but a considerable number has been recorded; and, as they are sure to set up corporeal endometritis—whether slight or severe depends on the virulence of the infection, and other circumstances—it is desirable to refer to the subject here.

I have met with two cases myself. In one a piece of a sponge tent was the foreign body found in the uterus after dilating the cervix. According to the history it had been in utero about three months, and the endometritis was not sufficiently severe to cause general constitutional symptoms. The only symptom was an unexplained and persistent purulent discharge. The notes of this case are as follows:—

CASE OF PIECE OF SPONGE TENT IN THE UTERUS.

Mrs. X., the wife of a medical practitioner, had certain symptoms, which induced her husband to pass a sponge tent into the cervix on July 18. This was left in for twelve hours; it was then withdrawn, and a second sponge tent was inserted; at the end of eighteen hours this "came away in pieces"; a third tent was then inserted; after it had been in place six hours "the pain was so great that it was withdrawn."

A few days after there was "a slight discharge of mucous matter." She used a vaginal douche of Condy's fluid twice daily, and went to the seaside on August 3.

About this time the vaginal discharge increased in quantity, and became distinctly purulent and offensive. Menstruation began on August 19, and lasted a week, the patient losing twice as much as usual. The next period began on September 14, and lasted five days; it was also profuse. All this time the purulent, offensive discharge continued. Soon after this I was asked to see the case. The uterus was a little enlarged, and a little tender, and there was a purulent discharge escaping from the os uteri. I advised her to rest in bed, and to have hot vaginal douches several times a day to

see if she would get well spontaneously. This was tried for two or three weeks without any improvement. Accordingly I dilated the cervix with Hegar's dilators till I could pass my finger into the uterus. I then felt something lying loose in the cavity of the body of the uterus. On removing it, I found this to be a piece of sponge, three-quarters of an inch long by about a quarter of an inch wide. The uterus was washed out in the usual way. I have since heard from her husband that she made an uninterrupted recovery, and that the discharge ceased entirely within a fortnight.

There seems to have been very little constitutional disturbance during the time the piece of sponge was in utero, but there was, I know, a slight elevation of temperature on one occasion at least. I considered the patient very fortunate to have survived; no less than three sponge tents had been used consecutively, and a piece of one left in utero three months; a good many patients so treated would have died of septicæmia.

In the other case the foreign body found in the uterine cavity was a hairpin, which the patient had inserted into the uterus herself—probably for the purpose of procuring abortion. It would not have been detected but for having an *X*-ray photograph prepared, which showed the hairpin clearly. I believe this is the first case in which the presence of a hairpin in the uterus was detected by the *X*-rays. In this case the introduction of the hairpin caused virulent septicæmia, and the patient narrowly escaped with her life. The history of the case is as follows:—

Case of Hairpin in the Uterus, discovered by the *X*-Rays.

The patient, a married woman, aged 28, came to the out-patient department at the London Hospital on January 11, 1902. She had had two children, and a premature labour two years and a-half previously. When asked what she complained of, she said there was "a hairpin in the womb." Her account, which is probably not to be altogether relied on, was that the periods had been quite regular, and that her last period had occurred at the beginning of January, 1902. She said that on the morning of January 10—the day before she came to the Hospital—she had bearing-down pains, and noticed "the womb" coming down. She tried to put it back herself, and thought it was an "abscess." She endeavoured to open the "abscess" with a hairpin, and while trying to do this the pin slipped in, and she saw no more of it. She was sure it had not come out. She explained that at the time she used the hairpin she was bending forwards with her legs apart, and straining. When

the hairpin slipped in, she became alarmed, and came up to the London Hospital, where she was seen in the receiving-room on the afternoon of January 10. The receiving-room officer could find nothing particularly wrong, and referred her to the out-patient department, where I saw her on the next day.

I examined her carefully in the usual way. There was a slight amount of bloodstained discharge in the vagina. On straining, a slight prolapse of the anterior vaginal wall was seen. The external os was a little more patulous than normal. The body of the uterus was only a little larger than normal, and was freely movable. Nothing could be felt suggesting the presence of a hairpin in either the vagina, or the os uteri. I sounded the bladder carefully, thinking it possible that the hairpin might have passed into the bladder; but the result was negative; and, besides, she complained of no symptoms referable to the bladder. Finally I passed the sound into the uterus, but could feel no sensation such as might have been expected if the uterine sound touched a metallic body such as a hairpin. At this stage of the proceedings I was certainly of opinion that the patient had made a mistake, and that, if the hairpin had ever been passed in, it had merely been in the vagina, and had dropped out without the patient's knowledge. Before deciding to send her away, however, I thought it would be well to have a radiograph taken. Accordingly she was sent round to Mr. Harnack, who was in charge of the photographic department, and in about an hour's time he brought me round the radiograph which is here reproduced (Plate VI). It showed quite well that there really was a hairpin somewhere about the centre of the pelvis, with the points directed downwards, and the blunt end upwards and to the right. The patient was then admitted to the Hospital. At about 5 p.m. she was anæsthetized, and with strict antiseptic precautions the cervix was dilated with Hegar's dilators till I could get my finger in. The cervix was soft, and dilated easily. As soon as I could pass my finger to the region of the internal os I felt the hairpin, the points of which were tightly fixed into the uterine tissue at that level. It was easy to seize each point with a pair of small Wells' artery forceps. The points were then drawn together, and the hairpin was removed. The hairpin with the Wells' forceps still attached to the points is shown (Fig. 75). It will be noticed that the blunt end of the hairpin lay high up in the uterus, and the points just at the internal os. So that if the patient, as she maintained, had been trying to open an abscess, she had evidently been trying to do so with the blunt end of the hairpin.

After removing the hairpin the endometrium was carefully explored, and a mass of membrane and obvious placental tissue the size of a large walnut was removed. It should have been mentioned that in the out-patient department one of my clerks, who examined the patient after me, noticed a little white solid body on his finger. Subsequent examination of this microscopically showed that it was a piece of fœtal bone. It is therefore quite certain that the patient had been recently pregnant, and was in fact in a state of incomplete abortion when she came to the Hospital. It also seems practically certain that the hairpin was used with

the intention of bringing on a miscarriage. The patient's temperature on admission was about 100°; and, though all the steps of the operation necessary to remove the hairpin were conducted as aseptically as possible, she became very ill soon afterwards.

Thus on January 13 her temperature reached 105°, and on the 16th she had a rigor, and the temperature rose to 106°. She had a second rigor on January 20, when the temperature rose to 104°. By this time there was well-marked evidence of pelvic cellulitis on the left side. On January 23 the left ankle became painful, and gradually the left leg and

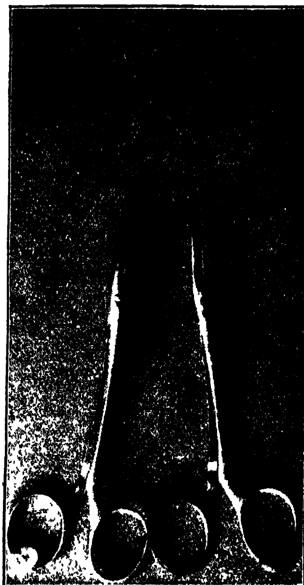


FIG. 75.—The hairpin as it appeared on removal from the uterus with a pair of Wells' forceps on each sharp end. By approximating the two forceps the hairpin was easily withdrawn.

thigh became much swollen; the circumference of the thigh measuring 5½ in. more than that of the other.

On February 24 it was evident that there was a large collection of pus on the inner side of the left thigh. On March 1 two incisions, about 7 in. apart, were made on the inner side of the thigh, and about 1½ pints of pus removed; a drainage tube was inserted, entering at one incision, and coming out at the other. On the 10th two incisions were made on the outer side of the left thigh, which was still much swollen, but no pus came out.

On March 22 an incision was made into the left side of the vagina, where a fluctuating swelling had appeared, and a small amount of pus was let out. After March 31 the temperature was normal, and the patient

convalesced, leaving the Hospital on April 26. There was still some œdema of the left leg, but the patient could walk with assistance. I saw the patient about a month later, when she came up to the Hospital to report herself. She was then quite well.

At the time when the case was under my care (1902), I looked up the subject of foreign bodies in the uterus, and the following note is an epitome of what I found :—

NOTE ON FOREIGN BODIES IN THE UTERUS.

While foreign bodies in the uterus are no doubt relatively rare, yet the absolute number of cases recorded is considerable. Thus F. L. Neugebauer has written a paper on Foreign Bodies in the Uterus (a translation of which is to be found in the *Revue de Gynécologie et de Chirurgie Abdominale*, vol. ii. 1898, p. 983) in which 74 examples are given.

As to the kind of foreign body found in the uterus, his cases may be classified as follows:

In 16 cases the foreign body was a hairpin.
In pessary, or part of a pessary.
In tent, or part of a tent.
In needle.
In piece of a gum-elastic bougie.
In goose's feather.
In piece of stick.
In piece of a sound.
In knitting-needle.
In piece of a catheter.
In piece of the pipe of a syringe.
In silver suture used at a previous Caesarean section.
In leech.
In piece of metal candlestick.
In chicken-bone.
In piece of twisted metal, probably a pin.
In piece of clay pipe.
In an indiarubber ball.
In a piece of whalebone.
In wooden reel.
In piece of straw.
In piece of glass rod.
In silk ligature.
In ½ lb. of hair from a t[illegible] wig.
In an Apostoli's electrode.
In 3 cases the exact nature of the foreign body is not stated.

74 cases.

In many of these cases a portion of the foreign body was in the cervix, or projecting into the vagina, when the patient came under observation, so that there was no difficulty in recognising the presence of a foreign

PLATE VI.



body. In others, however, this was not so, and the foreign body had passed completely out of sight.

Among the 16 cases of hairpin in the uterus, that recorded by Taunen most closely resembles my case in that he could not recognise the presence of the hairpin by ordinary methods of examination, even by using the uterine sound. It was only after dilating the cervix, and passing in a curette that the hairpin was discovered.

In the large majority of the cases in which a hairpin has been found in the uterus, if not in all, it is certain that it had been introduced for the purpose of bringing on abortion. It is remarkable that in only 1 of the 16 cases did the introduction of the hairpin cause death (case described by Partridge, *American Journal of Obstetrics*, 1885). In 2 cases, where the hairpin was put in to cause abortion, it was artificially extracted; in one case where the woman was 2½ months pregnant, and in the other where she was four months pregnant, without interrupting the pregnancy (cases of Frintnight, *American Journal of Obstetrics*, 1887, and E. Hughs, *Medical Age*, 1886).

In 1 case Meschecde found a hairpin in utero at a necropsy. The patient had been admitted into hospital for rheumatism and hystero-epilepsy. There was no doubt the hairpin had been in utero a very long time (*Verein für wissenschaftliche Heilkunde*, *Koenigsberg*, 1873).

So far as I have been able to ascertain, the case I have recorded above is the first in which the presence of a hairpin in utero has been discovered by the *X*-rays.

It remains to say a word on the diagnosis of corporeal endometritis from primary malignant disease of the body of the uterus.

In the latter disease the patient is usually old, most cases being between fifty and sixty years of age.

Then *the course of the disease* will help us; corporeal endometritis runs a chronic course, and deterioration of the general health from accompanying menorrhagia is only very gradual, whereas in malignant disease there is loss of strength and sometimes, but by no means always till a late stage, of weight also. Again, in malignant disease of the body of the uterus, *severe pain* is sometimes, though by no means always, an early and marked symptom; whereas in corporeal endometritis, pain, if present, is much less severe. Further, whereas the starting-point of corporeal endometritis is often labour, or abortion, malignant disease of the body of the uterus usually begins long after the menopause, and usually affects those who have been either actually sterile, or who have had only one or two children.

Lastly, in cases of doubt we can scrape away portions of the masses projecting into the uterine cavity, and examine sections of them with the microscope.

In the corporeal endometritis of old women the surface of the mucous membrane of the body of the uterus is smooth; sometimes there is occlusion of the internal or external os; sometimes, after occlusion of either the internal or external os, there is a considerable accumulation of purulent secretion, often intensely fœtid, in the cavity of the body of the uterus. This condition is known as *pyometra*. It is most often found as a complication in cases of cancer of the cervix.

Pathology.—*In acute cases* the mucous membrane is said to be swollen, and secreting pus.

In chronic cases, which are those we have most frequently

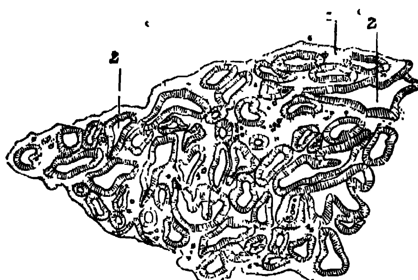


FIG. 76.—SECTION OF A GRANULATION, FROM A CASE OF CORPOREAL ENDOMETRITIS (De Sinéty).

1. Stroma. 2. Dilated glands.

to deal with in practice, there is *hypertrophy of the mucous membrane of the body of the uterus.*

The hypertrophy of the mucous membrane is said to affect all the elements of the mucous membrane, the glands (as in Fig. 77), the blood-vessels, and the connective tissue.

Treatment.—When the general features of the case lead us to determine on local treatment, *e.g.*, *persistent menorrhagia* for which no other cause can be found, and which resists ordinary treatment by ergot, hot douches, &c., or *recurring abortion*, for which no reason can be found, the best practice is to dilate the cervix, and examine the surface with the finger to render our knowledge of the case as precise as possible; then, to scrape the whole of the interior of the

uterine body systematically with a curette, afterwards applying tincture of iodine (pure) to the whole of the surface, and washing away any excess with a douche of weak iodine water through the intra-uterine tube.

Corporeal endometritis is certainly a cause of sterility, or, if pregnancy occurs, a predisposing cause of abortion. *Cervical* endometritis probably has little or no power to cause either sterility or abortion.



FIG. 77.—HYPERPLASIA OF ENDOMETRIAL GLANDS (*micro-photograph*).
Showing the typical "corkscrew" appearance which results from abnormal elongation of the glands. The projections into the lumina are well seen, and in transverse section show either as a solid string of epithelium, or an inner concentric lumen. The epithelium is everywhere single-layered. There is no suspicion of malignancy. Section of material curetted from the endometrium. The patient was a single woman, aged 29, suffering from severe spasmodic dysmenorrhœa.

METRITIS.

By this is meant interstitial inflammation of the uterus, inflammation of the uterine tissue lying between the peritoneal surface on the one hand, and the mucous surface on the other. Although metritis is a real condition, it cannot be easily diagnosed apart from the inflammation of the

mucous surface, or inflammation of the peritoneal surface, of the uterus. When either of these conditions is present in marked degree, it may be taken that there is more or less metritis present as well. The case is analogous to pericarditis and endocarditis in relation to myocarditis.

Chronic metritis—Simple uterine hypertrophy—Fibrosis uteri.

In some cases we meet with a uniform and considerable enlargement of the body of the uterus in circumstances which make it impossible to ascribe the enlargement to subinvolution. Probably the enlargement referred to is due to a chronic metritis. There is in some cases considerable increase in the amount of fibrous tissue in the uterine wall. Such cases are identical with those described as fibrosis uteri. In others nothing abnormal is found on microscopical examination, although the wall of the uterus may be twice as thick as it should be. The change seems to be one of simple hypertrophy, or hyperplasia of the normal elements. There is often profuse menorrhagia in these cases.

In chronic cases, where curetting has failed to cure the menorrhagia, the application of pure nitric acid to the endometrium—a treatment originally suggested by Atthill—will probably be effectual—at all events, for a time. It is applied, after dilating the cervix, through a short glass tube made to fit the cervical canal, and so protect it from the action of the acid, which might otherwise cause stenosis. In cases where this fails, the best treatment is hysterectomy.

SUBINVOLUTION OF THE UTERUS.

Immediately after delivery the uterus weighs about twenty-eight ounces.

Under normal conditions its weight falls in six weeks' time to about one ounce and a half. The process by which this change is accomplished is known as the *Involution of the Uterus.*

The uterus of a woman who has borne children always, however, remains permanently somewhat larger than the uterus of a nullipara.

DIFFERENCES BETWEEN THE UTERUS OF A VIRGIN AND THE UTERUS OF A WOMAN WHO HAS BORNE CHILDREN.

The uterus of a virgin (Fig. 78).

Length.—Its whole length, measured externally from the highest point of the fundus to the external os, is about two inches and a half. A slight constriction, visible externally, divides it into two parts, nearly equal in length—the upper and slightly longer portion comprising the fundus and body of the uterus, the lower portion being the cervix.

Cavity.—On coronal section (Fig. 78, C) we see that, in the virgin, the cavity of the body is rather shorter than the cavity of the cervix.

In shape the cavity of the body is triangular, the sides of the triangle being convex inwards. The cavity of the cervix is fusiform, and is marked by a longitudinal ridge, anteriorly and posteriorly, from which secondary ridges spring, directed obliquely upwards; this arrangement is called the *arbor vitæ.*

The length of the cavity of the uterus in virgins averages 2·1 inches (Barnes). Owing to stretching of the tissues, however, the sound generally passes about 2¼ inches in virgins.

External os.—In virgins this is either round, or transverse; its outline is free from irregularities, and its longest diameter varies from half a line to two lines, $\frac{1}{24}$ to $\frac{1}{6}$ inch (Lusk).

The uterus of a woman who has borne children.

Length.—Its whole length externally is about 3 inches, 2 inches of which belong to the fundus and body, and 1 inch to the cervix.

Cavity.—On section the cavity of the body is seen to be distinctly longer than that of the cervix. In shape the cavity of the body is more ovoid, the sides being rather concave inwards, than convex, as in the virgin.

The length of the cavity of the uterus in parous women is not less than 2½ inches.

External os.—This is either round, or transverse; its outline is irregular from the slight lacerations that occur physiologically in labour. The os is often large enough to admit

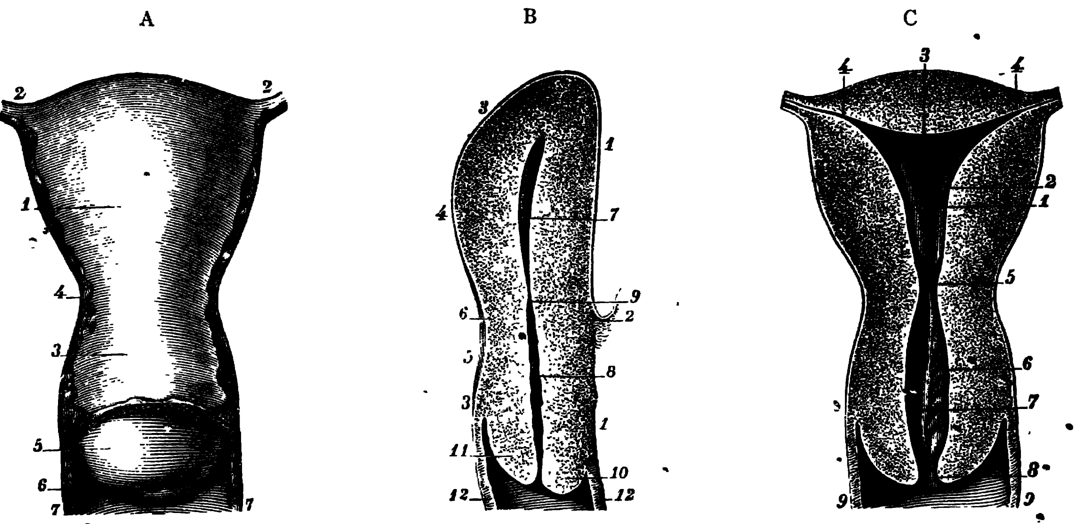


FIG. 78.—VIRGIN UTERUS.

A, Anterior view; B, antero-posterior median section; C, coronal section (Sappey). A, 1, body; 2, 2, angles; 3, cervix; 4, site of the os internum; 5, vaginal portion of the cervix; 6, external os; 7, 7, vagina. B, 1, 1, profile of the anterior surface; 2, vesico-uterine cul-de-sac; 3, 3, profile of the posterior surface; 4, body; 5, neck; 6, isthmus; 7, cavity of the body; 8, cavity of the cervix; 9, os internum; 10, anterior lip of the os externum; 11, posterior lip; 12, 12, vagina. C, 1, cavity of the body; 2, lateral wall; 3, superior wall; 4, 4, cornua; 5, os internum; 6, cavity of the cervix; 7, arbor vitæ of the cervix; 8, os externum; 9, 9, vagina. In Fig. A, representing the anterior surface of the uterus, it should be borne in mind that the peritoneal coat only extends as low as 4, the level of the os internum. Below that the supra-vaginal cervix is anteriorly in close relation with the bladder, from which it is only separated by a rather loose connective tissue.

the tip of the finger, and its longest diameter measures about ½ inch.

Etiology of subinvolution.—The process of involution is interfered with by any of the following causes:—

1. *Pelvic inflammation* (perimetritis, parametritis).

2. *The retention of portions of placenta or membranes, or of clots*, after labour or abortion. In such cases corporeal endometritis is likely to co-exist. (See page 169, Case II., for a very typical case of subinvolution in connection with corporeal endometritis.)

3. *The presence of fibroid tumours of the uterus.*—I have

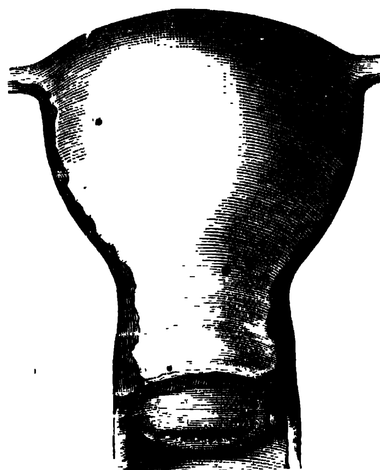


FIG. 79.—MULTIPAROUS UTERUS, ANTERIOR SURFACE (Sappey).

Note.—The peritoneum should only be figured covering the uterus as low as the internal os on the anterior surface.

seen several examples of subinvolution associated with, and apparently due to, the presence of uterine fibroids.

4. *Passive congestion of the uterus* due to getting up too soon after labour, and more particularly getting up too soon after abortion or miscarriage—the patient not thinking it necessary to remain in bed so long after the latter as after delivery at full term.

The way in which passive congestion occurs in such cases is as follows:—The uterus is still larger than normal, and the

tissues around it lax. When the patient gets up the uterus descends—there is a certain degree of prolapse; this of itself, by dragging on the veins in each broad ligament, causes increased difficulty in the venous blood passing off, *i.e.*, produces passive congestion.

The descent of the uterus is associated with some degree of retroversion, either alone, or combined with retroflexion; and, owing to the size of the uterus, the *incarceration of the uterus in Douglas' pouch*, described in the chapter on Versions and Flexions, is very apt to occur, still further increasing venous congestion, and retarding the process of involution.

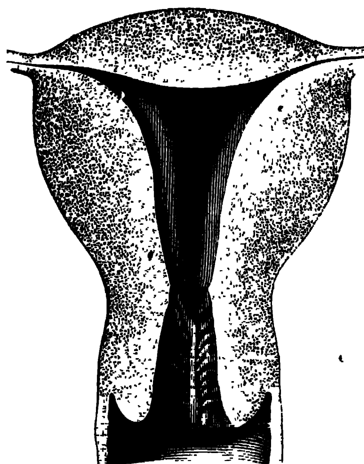


FIG. 80.—MULTIPAROUS UTERUS, UTERINE CAVITY (Sappey).

The symptoms of subinvolution are:—

More or less bearing down pain, and backache.

Menorrhagia, and often also metrorrhagia.

A yellow discharge, which may be offensive.

On examination we find the body of the uterus larger than it ought to be, perhaps very much larger (as in the case already referred to on page 169, Case II.). Very often we find the uterus lower than normal, and retroverted or retroflexed; and it is particularly in cases of this kind that incarceration of the uterus in Douglas' pouch is commonly met with. As this condition is fully described later on, it is unnecessary to

say more about it here. Sometimes a polypoid mass may be found just within the external os.

The sound passes an increased distance, 3¼, 3½, or 4 inches. In bad cases it may pass 5 or more inches, according to circumstances. It is important to notice that the bimanual examination often shows that the uterus is larger than it should be, that there is subinvolution, when the sound only passes the normal distance, or a very little more. Here the increased bulk of the uterus is due to excessive thickness of the walls.

Before passing the sound, it is of course necessary to make certain that the enlargement of the uterus is not due to pregnancy; as regards the history, the symptoms dating from a particular confinement or miscarriage will usually help us, and as regards physical signs, the feeling of the body of the uterus in subinvolution is different from the feeling it has in pregnancy. In subinvolution, though the uterus is enlarged, it feels firm and hard on bimanual examination; its shape is distinctly flattened from before back, although the thickness of the walls is increased. In early pregnancy the shape of the enlarged body is more globular, its outline is less definite, and it has an elastic feeling.

Other signs likely to be present in pregnancy, such as purple discoloration of the vaginal mucous membrane, and of the vaginal portion of the cervix, and softening of the cervix, will also aid us in diagnosis.

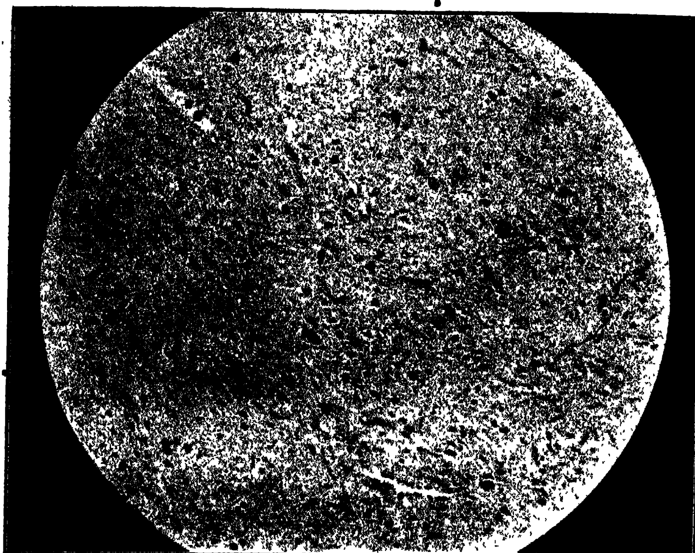
Treatment.—*Preventive treatment.*—When we look at the etiology of the disease, we see at once that it usually arises from preventable causes. Thus, as regards pelvic inflammation occurring after labour or abortion, we know that this is due to infection, and moreover in most cases the infection is due to dirty hands, finger-nails, or instruments—careful regard to antiseptic principles in midwifery practice is therefore of the first importance. This is more fully discussed under Pelvic Peritonitis.

Careful attention to see that all the placenta and membranes have come away is another element in the preventive treatment of subinvolution. Again, it is well to give ergot for a week after labour as a matter of routine in all cases. The patient should be advised to suckle, in the absence of

any strong reason to the contrary. Another point is to see that the patient does not get up too soon after labour. The continued presence of a red discharge after delivery or abortion is to be looked on as an indication that the patient should remain in the recumbent position, although not necessarily in bed. When the time for preventive treatment has gone by, and a case of subinvolution comes before us, if there is no offensive discharge, and if there is nothing felt just within the external os, such as placental polypus, the treatment should consist of replacing the uterus, if necessary, with the sound, and inserting a ring pessary to keep it in good position. The patient should remain in bed for a time. Hot vaginal douches should be given three times a day. For medicine, she should take some preparation of ergot thrice daily. Under this treatment many cases get well. If, however, the case does not improve after this treatment has been tried for three weeks or so, the next thing to do is to dilate the cervix, and examine the interior of the uterus for a piece of adherent placenta, or other abnormality of the endometrium, and if we find anything of the kind, to remove it.

I may refer here to a rare case of subinvolution, due to retained products of conception, in a young girl aged only sixteen. She was brought up to the Hospital by her mother on January 22, 1910, on account of excessive losses of blood. The history was that the catamenia had been irregular since November, 1909. In the middle of December she passed "a large clot of blood," and suffered a great deal of pain. After that, there was said to have been no further bleeding till the day before her admission, when she again passed a large clot. She was markedly anæmic. On examination the hymen had evidently been stretched—not very recently; the uterus was rather bulky, but otherwise normal. On February 3rd the cervix was dilated up to No. 18 Hegar. It dilated easily. The finger passed into the uterus discovered a soft polypoid mass the size of a filbert near the fundus. This was removed with ovum forceps.

A section of the tissue removed showed under the microscope a well-marked decidual cell change (as represented in the two micro-photographs on page 187), and in the other



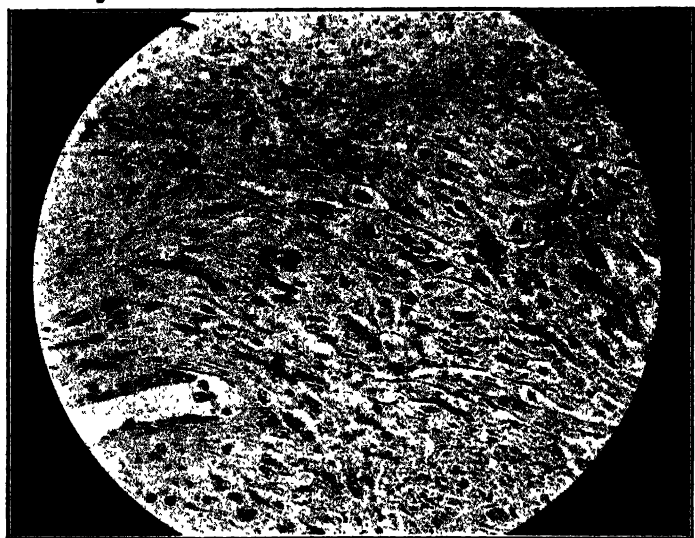


FIG. 81.—UTERINE DECIDUA OF RECENT PREGNANCY (*micro-photographs*). The section shows a tightly packed sheet of polygonal and spheroidal cells with well-stained nuclei, but indefinite cell outline. A dilated uterine gland can be seen with some proliferation of its epithelial lining. Several dilated capillaries are seen in the field (× 77 and × 110 respectively).

portions of the section (not shown in the photographs) were several ill-stained hyaline chorionic villi.

The case shows the importance of not forgetting the possibility of incomplete miscarriage in cases of excessive bleeding, even in so young a patient.

If there is an offensive discharge from the uterus, with persistent subinvolution, as in the case described on page 169, Case II., the treatment adopted there is the right one: scraping the whole of the endometrium thoroughly with a curette, if necessary, after previous dilatation of the cervix.

It is not advisable to use a curette when removing anything from the *puerperal* uterus. The finger and ovum forceps can do all that is required. A good practical rule is not to use a curette within a month of the time when the confinement or miscarriage occurred.

In all intra-uterine manipulations the vagina should first be douched with an antiseptic lotion, and the hands and instruments should, of course, be carefully rendered aseptic; after we have finished, the cavity of the uterus should be washed out through a double-channelled tube with iodine water (ʒii. Tr. iodi—Oj).

When there is evidence of acute, or subacute, pelvic inflammation, this, rather than the subinvolution, must of course be regarded as the important element in the case, and treatment suitable for it must be adopted. It is dangerous to dilate the cervix, or curette the uterus, in cases where there is pelvic inflammation.

Superinvolution of the Uterus.

Definition.—Excessive involution of the uterus. The disturbance of the involution is here in the opposite direction from subinvolution; the process goes too far, and leaves the uterus atrophied.

We know little of the causes of this condition. The symptoms are amenorrhœa and sterility, and the diagnosis depends on finding by bimanual examination, and on passing the sound, that the uterus is much smaller than it should be.

Nothing can be done in the way of cure; and if the patient's general health is good, the case is best left alone.

Notes of two cases which came under my care at the London Hospital are appended :—

CASE I.—A. S., aged 33; married nine years; three children, the last three years previously, and still-born. No miscarriages. All the confinements difficult; forceps used in second confinement.

Has not menstruated since the last confinement. She lost more blood after the last confinement than after the others, "as the afterbirth had grown to her side."

For the last five months has suffered from headache. There has been no epistaxis, or other loss of blood. Every month she feels as if menstruation were coming on, and has some yellow discharge.

The catamenia appeared when she was fifteen, and she was always regular, though the loss was scanty.

Has had sore throat, on and off, the last twelve months.

Bowels confined as a rule.

Pelvic measurements.—Between anterior superior spines = $8\frac{1}{4}$ inches; between iliac crests = $9\frac{1}{4}$ inches; external conjugate = $6\frac{3}{4}$ inches.

On bimanual examination the uterus was found to be very small in all directions; the sound passed rather less than 2 inches.

(N.B.—In women who have had children the sound passes at least $2\frac{1}{2}$ inches, often $2\frac{3}{4}$ to 3 inches.) Nothing else abnormal was found.

CASE II.—C. S., aged 29, married six years; one child, five years ago; no miscarriages. Confinement normal; no post-partum hæmorrhage. She suckled the child six months. The child died when it was ten months old. Has not menstruated since the confinement. She is well in herself, except that sometimes she feels "heavy in the head." The catamenia appeared at fifteen; she was regular every month, always losing very little; it lasted two or three days, and she had no pain to speak of at her periods.

On vaginal examination the uterus was quite small, as estimated bimanually.

The cervix projected very little into the vagina The sound passed just 2 inches. There was nothing else abnormal.

Remarks.—In both cases menstruation had always been scanty. In Case I. the patient had had three children, so that in her case scanty menstruation could hardly be taken as evidence of deficient ovarian activity, at least as regards the highest function of the ovary—ovulation.

The pelvis in this case was an example of the "justo-minor" pelvis—there being a slight degree of general contraction. Looked at from another point of view, cases of superinvolution might be regarded as examples of a premature onset of the menopause.

CHAPTER X.

DISEASES OF THE UTERUS.

FIBROID TUMOURS.

Etiology.—It is only during the period of menstrual life, between the ages of fifteen and forty-five, that fibroid tumours of the uterus *begin* to grow.

Clinically, it is rare to meet with them till after the age of five-and-twenty.

Influence as regards conception and labour.—In general terms it may be said that a woman who has fibroid tumours in her uterus is less likely to become pregnant than other women (about one-third of married women with fibroid tumours are sterile). If she should become pregnant, she has a special liability to abort. Apart from this the patient may have very severe pain. This may be so great that the pregnancy cannot be allowed to continue. Or, again, there may be retention of urine from incarceration of the fibroid in the pelvis. Also, the tumour may undergo necrobiosis, and serious symptoms (fever, &c.) may occur requiring hysterectomy to be performed without delay. If, however, she goes to full term, then special dangers may arise :—

1. *During labour*, from mechanical obstruction to the passage of the child, varying with the exact position of the fibroid, the greatest obstruction occurring with a large interstitial fibroid in the cervix. In such a case delivery per vias naturales may be impossible.

I have had two cases of Caesarean section* for obstruction due to fibroid tumours. In both the result was successful as regards both mother and child.

2. *Immediately after labour*, from post-partum hæmorrhage.

* See *Lancet*, January 17, 1903.

3. *Later*, from secondary hæmorrhage, or septic fever, if the fibroid should slough owing to injuries received during labour.

In the majority of cases, however, in which fibroids complicate pregnancy, the pregnancy is unaffected, labour occurs normally, and the course of the puerperium is uneventful.

Some persistent cases of subinvolution are due to the presence of fibroids, the uterus for weeks remaining about as large as it was immediately after labour. I have seen several cases of this.

During pregnancy fibroids grow, sharing in the general hypertrophy of the uterus.

Very rarely after labour, under the influence of the process of involution, fibroids may disappear altogether, but well-authenticated cases of this are on record.

The following case illustrates some of the complications which may arise in cases where pregnancy occurs with fibroids:—

CASE OF FIBROIDS COMPLICATING PREGNANCY.

The patient was aged 34. She was married on April 7, 1908, and she was sent to see me on June 29, 1908, by Dr. Parsons, of Westbury, Wiltshire. She had had some difficulty in passing water three weeks after marriage. This became worse on June 18, when retention occurred, and a catheter had to be passed on that date and for some days afterwards. For a few days before I saw her she had been able to pass water naturally. She gave a history that the water had passed very slowly for a long time—even before her marriage. The menstrual period, as a rule, lasted six days, and there was a good deal of pain on the first day in the lower abdomen and back and down the thighs. Since her marriage she had "seen nothing." The last period occurred during the last week of March, 1908. Counting from the date of her marriage, if she were pregnant, the confinement would be due about January 12, 1909.

On examination (June 29, 1908) the breasts were found to be distinctly active. There was a hard swelling occupying the lower abdomen, and reaching nearly to the umbilicus. On vaginal examination a hard convex mass was felt occupying the pelvis and bulging down the posterior vaginal wall. The cervix was high up behind the pubes, and completely out of reach. I thought she was pregnant, and advised that she should be seen at intervals during the pregnancy to see if the pelvic fibroid would move out of the pelvis, as if it did not do so, delivery by Cæsarean section would be necessary. Towards the end of October some vaginal hæmorrhage occurred, and she was admitted into the London Hospital under my care. I

examined her there on October 27, and found the pelvic fibroid had moved up completely out of the pelvis. The cervix occupied its normal position, and there was a medium-sized mucous polypus seen attached to it, which seemed to have probably been the source of the bleeding just mentioned. At this time the abdominal tumour reached the epigastric region, and its surface was irregular. After a few days' rest in hospital, as there was no further sign of miscarriage, she was sent out, but directed to come in again in time for the confinement.

Readmitted December 6, 1908. On December 9th she had a rigor, and the temperature rose to 102°. Labour came on, and she was delivered naturally of an eight months' fœtus at 2 a.m. on December 10. The child, a female, was stillborn. On December 10 the temperature reached 103°, and from that date till February 1 the temperature was persistently febrile at night, varying from 100 to 102 or 103, often falling to normal, or below normal, in the morning. She had a rigor on December 30, the temperature reaching 104. I examined her on December 17, and found the greater part of the abdomen still occupied by an irregular tumour. It reached 2 inches above the umbilicus in the middle line, and in the right nipple line to within 1 inch of the costal margin. There was no evidence of any pelvic inflammation on vaginal examination. In spite of the persistent fever the patient's general condition remained fairly good, and though I thought the fever was probably due to some change taking place in the fibroids, I determined to refrain from interfering as long as possible. On February 1, 1909, a fibroid tumour the size of a man's fist was expelled from the uterus, together with about 15 ounces of extremely fœtid pus. The temperature fell the same day, and continued normal subsequently. Convalescence was rapid, and the patient left the Hospital on February 16. On examination on February 11 the uterus still reached as high as the umbilicus on the right side. It was just movable. An irregular projection could be felt at the highest point of the fundus, and another the size of a Tangerine orange to the right side of the uterus, so that two other fibroids besides the one extruded still remained.

The importance of not being in a hurry to decide on hysterectomy in such circumstances as those detailed above appears from the subsequent very interesting history. Before long, after returning home, the patient became pregnant again. This time she passed through the pregnancy and labour uneventfully, and was delivered of healthy twin girls. The puerperium on this occasion was uneventful. The mother sent me a photograph of the twins when three months old. They were strong and well.*

VARIETIES.

As regards position.—All fibroids begin as ***interstitial*** fibroids, *i.e.*, at first they lie embedded in the thickness of the uterine wall. As they grow they make their way either

* The above case is recorded in the *Proc. Roy. Soc. Med.* (Obst. Section), vol. ii., p. 229.

towards the peritoneum, or towards the mucous membrane of the uterus, and are then termed *subperitoneal* or *submucous* fibroids respectively. A fibroid ceases to be *interstitial* only when its largest diameter has passed beyond the uterine wall, and when its attachment to the uterus is by a more or less constricted part, or neck. Gradually, in many cases, more and more of the tumour is expelled from the uterine wall till at last the original tumour hangs by a distinct *stalk*; it has then become a fibroid *polypus*.

When there is a distinct stalk to a fibroid arising from

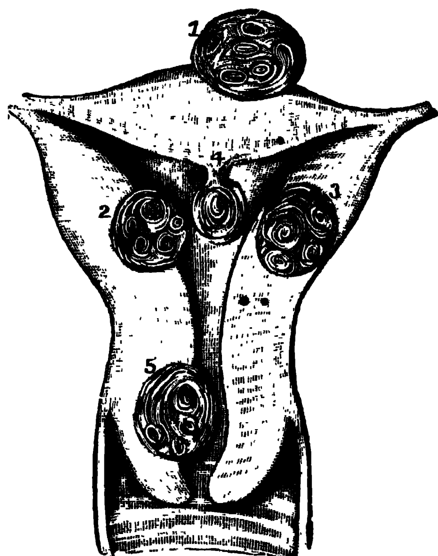


FIG. 82.—TYPICAL VARIETIES OF FIBROIDS (Thorburn). (Diagrammatic.)
1. Subperitoneal; 2. Submucous; 3. Interstitial: 4 in the figure has a distinct stalk—*i.e.*, is a polypus; 5. Submucous fibroid of the cervix.

the endometrium, *i.e.*, when it has become a polypus, the tumour, unless it be small, generally lies, partly at least, in the cavity of the cervix, and not wholly in the cavity of the body.

Number.—Fibroids are usually multiple; it is exceptional for there to be only one.

Position.—They most commonly grow from, or in, the walls of the body of the uterus, and are more common in the posterior than in the anterior wall. Less commonly they

grow from the supra-vaginal cervix, and still less commonly from the vaginal portion of the cervix.

Interstitial fibroids of the cervix are not unfrequently solitary. When there is a large, solitary, interstitial, cervical fibroid the vaginal portion of the cervix presents a characteristic deformity. For instance, if the tumour lies in the posterior wall, the posterior lip of the cervix becomes obliterated as such, and is simply spread out as a thin layer over the convex under-surface of the tumour. In these cases the body of the uterus, often quite unaltered in size and shape, may be found perched on the top of the cervical fibroid (Fig. 83). I have recorded several cases of this.*

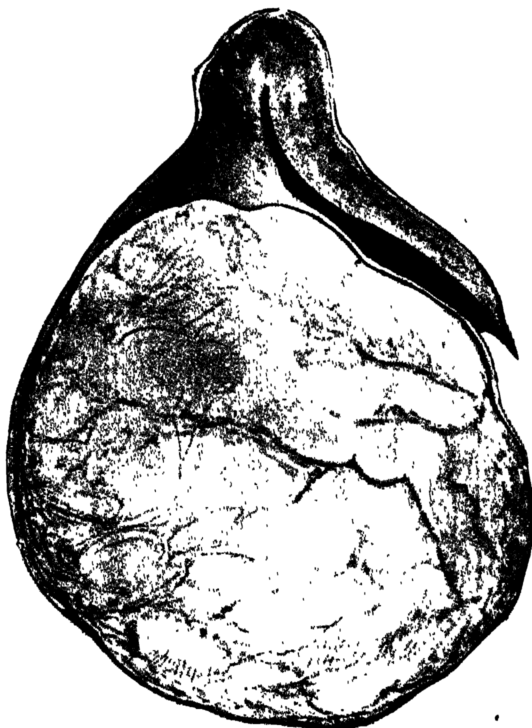


FIG. 83.—INTERSTITIAL FIBROID OF THE CERVIX—ANTERIOR WALL. (From case of "A. T.," on p. 195.)

* *Trans. Med. Soc.*, London, vol. xxiv., 1901, p. 16, "On Fibroids of the Cervix Uteri"

A. T., a single woman, aged 38, a housekeeper by occupation, was admitted into the London Hospital under my care on October 4, 1899.

History.—She said that the periods had been excessive for the past three years, and had been attended with pain.

During this time the menstrual period had generally lasted for a fortnight or more, and the amount lost at each period had gradually increased. Menstruation began at the age of 11, and she was quite regular every four weeks, the periods lasting about three days, and the loss being less than the average, till three years ago. Till then her general health had been good, and she had suffered from no illness, except measles, which she had at the age of 21. Of late she had noticed that her feet had swelled. During the last two years she had had a great deal of worry. Her appetite had been fair, but the bowels as a rule had been constipated.

Present state.—On admission the patient was profoundly anæmic. There was a loud systolic bruit heard over the cardiac area, soft and blowing at the apex, and harsh at the base. The bruit was also heard in the left axilla, and at the angle of the left scapula. The pulse was 114, soft and regular. The urine was normal.

On examining the abdomen old lineæ albicantes were seen on the lower abdomen. A hard, fairly central swelling was felt rising out of the pelvis, and extending to within three finger-breadths of the umbilicus.

Per vaginam, a hard mass was felt bulging down the anterior fornix; it was continuous with the swelling in the hypogastric region.

The external os was very far back and difficult to reach; it admitted the finger easily, and a short way within the os the finger came on a hard convex body projecting from the anterior wall into the cavity of the cervix.

The patient was so very anæmic that I decided to keep her at rest in bed taking iron and other tonics for some weeks before attempting any operation.

By November 5 her colour had improved a good deal, and on that day she was examined under anæsthesia.

I intended, if the tumour had been found to be definitely submucous—that is to say, one where the bulk of the tumour lies free in the cavity of the uterus and only a small fraction lies in the thickness of the uterine wall—to have removed it by morcellement after further dilating the cervix.

Under the anæsthetic, however, it was evident that the tumour was really interstitial, and about the size of a cocoa-nut.

The uterus was practically fixed, so that the cervix could not be drawn down at all. Under these circumstances it seemed to me much more dangerous to try and deal with the tumour from below than to perform abdominal hysterectomy, so that on that occasion nothing more was done, and the patient was put back to bed. After the examination the patient bled a little every day up to November 8. Her period began on November 12, and continued till the 20th; the loss was very considerable, and large clots were passed. She then felt very weak, and was again much more anæmic.

On December 11 the patient had a severe flooding; the bleeding was checked by hypodermic injections of ergotin and hot vaginal douches; it

continued, however, though the loss was only slight, till December 18. The position of matters was thoroughly explained to the patient, and she readily consented to abdominal hysterectomy.

Operation, December 28, 1899.—The abdomen was opened by the usual incision in the middle line. It was then seen that the fundus and upper part of the body of the uterus were of about the normal size, and perched upon the top of the tumour, which was evidently situated chiefly in the cervix.

The whole mass was firmly fixed, though there were no adhesions, so that at this stage it could not be pulled up at all. The upper part of the right broad ligament was divided between double ligatures, and the same thing was done on the left side, thus securing both sets of ovarian vessels. Still the tumour was quite immovable. Anterior and posterior peritoneal flaps were then made, and the bladder separated well down from the front of the mass.

The abdominal incision was prolonged upwards for about one inch, and an assistant pressed the mass firmly upwards from the vagina. The right uterine artery was then found and tied, the left uterine being secured with Wells' forceps, and tied at a later stage. The mass was then pulled up as firmly as possible, and by a circular incision the body of the uterus and the cervical tumour were separated from the small portion of the cervix remaining below the position of the fibroid, and removed. The cervical canal was swabbed out with 1-20 carbolic acid, and the edges of the cervix were closely sutured together. Owing to the stretching of the cervix by the upward growth of the tumour the walls of the cervix were very thin, in places no thicker than $\frac{1}{12}$ inch.

Several oozing points in the neighbourhood of the stump required ligatures. The peritoneal flaps were then sewn together over the stump, and a Keith's tube having been inserted, the rest of the abdominal wound was closed in the usual way.

The patient made an uneventful recovery, and left the Hospital on January 27, 1900.

Note on the specimen (Fig. 83).—The mass removed weighed 4 pounds 5 ounces.

It is roughly of the size and shape of a large cocoa-nut, except for a projecting knob at the top, which is the unaltered fundus and upper part of the body of the uterus.

On sagittal section it is seen that the fibroid is truly interstitial in position, the thickness of the uterine tissue being the same over the outer and inner aspects, and in both directions the lamella of uterine tissue is only very thin.

The tumour lies for the most part in the anterior wall of the cervix, a small portion of the upper part of it may have encroached on the lower part of the body of the uterus.

A small shaving was taken off the lower part of the tumour in removing it from the stump during the operation. This was taken away from the stump subsequently. Before making a sagittal section of the mass the opening into the cavity of the uterus admitted four fingers.

CASE OF ABDOMINAL HYSTERECTOMY FOR RETRO-PERITONEAL FIBROID (weighing 13½ lb.).

M. H., a single woman, aged 42, a Board School teacher, was admitted into the London Hospital under my care on June 3, 1902.

History of present illness.—She had first noticed a swelling in the abdomen about three or four years ago, and from that time it had gradually increased in size. Twelve months ago she began to have a feeling of weight in the abdomen, and a dragging pain, chiefly on the right side. The pain had been worse just before menstruation, and had been less severe immediately after the period; the pain had also been relieved by lying down. It had not been sufficiently severe to actually



FIG. 84.—RETROPERITONEAL CERVICAL FIBROID (Case of M. H.).
The cut edge of the peritoneum (C) is well seen, also a part (D) of the tumour that has undergone cystic degeneration.

prevent her going on with her work. She had, however, suffered from a feeling of increasing weakness and prostration, and from slight attacks of faintness when the pain had been severe. Of late the legs had swelled after standing. The bowels had been regular, and the appetite poor. There had been no trouble as regards micturition.

Menstrual history.—The catamenia appeared at the age of fourteen. Menstruation had never been regular; there had been intervals of five, six, and eight weeks between the periods. The period had generally lasted four days; the amount lost had been normal. During the twelve months before admission, menstruation had occurred more regularly. The periods about twelve months ago had lasted five or six days. During the three months preceding admission to the Hospital, however, less and less had been lost at each period.

State on admission.—The abdomen was markedly prominent from the epigastric region downwards. On palpation an irregular swelling was felt reaching in the middle line 4 inches above the umbilicus. In the right nipple line the tumour extended to the ribs, and reached far back into the right flank. In the left nipple line the highest point of the tumour was 2 inches from the costal margin. A loud uterine souffle was heard at various places over the surface of the tumour. The circumference of the body at the umbilicus was 36 inches. A little fluid was pressed out of the right nipple, but none could be pressed out of the left.

On vaginal examination it was found that the hymen admitted the finger without tearing. The posterior vaginal wall was bulged downwards and forwards by a fixed elastic swelling, having, it was judged, a transverse measurement of between 3 and 4 inches. The vaginal portion of the cervix could not be reached. I came to the conclusion that the tumour was probably a large uterine fibroid. The presence of the fixed portion bulging down the posterior vaginal wall led me to expect that an operation to remove the tumour would be more than usually difficult; and so it proved.

Operation, June 5, 1902.—The abdomen was opened by the usual incision in the middle line, and the incision was subsequently extended upwards so as to measure about 9 inches. The body of the uterus was readily seen. It was uniformly enlarged, so as to be about the size of the uterus immediately after delivery, and, as regards its shape, it was not in any way deformed. It at once became evident that the greater part of the mass forming the tumour lay behind and below the posterior layer of the peritoneum. The fibroid had evidently grown from the supra-vaginal cervix, burrowing below the peritoneum which formed Douglas' pouch, and raising this completely from the pelvis. It was impossible at this stage to move the tumour appreciably, and it was clear that the only way to remove it would be to incise the peritoneum forming the covering of the mass, and to gradually enucleate it from the extensive retro-peritoneal "bed" where it lay. I began by tying the left ovarian vessels, and then opened up the left broad ligament. Incisions were carried somewhat transversely through the peritoneum over the tumour, one in front of and below the body of the uterus, and one behind. All the usual relations were so much altered by the manner in which the tumour had grown, that it was impossible to follow the usual steps of an abdominal hysterectomy, making the peritoneal flaps at one stage, finding and tying the uterine arteries at another stage, and so on. The large vessels were tied as they came into view, or after they had been divided. Working first on one side and then on the other, the mass was gradually enucleated from its attachments. I was, of course, well aware of the probability that the pelvic part of the tumour would be in close proximity to one or both ureters, and on the left side of the pelvic offshoot of the tumour I found, and fortunately recognised, some 3 inches of the left ureter tightly stretched like a piece of narrow white tape over the left convex surface of this part of the tumour. It looked white, and not unlike

a piece of thickened fibrous tissue. It was carefully freed from the tumour, and the enucleation continued. I did not see the right ureter. Ultimately the whole tumour was freed from its attachments behind the peritoneum, and it was then found to be continuous with the uterus at the level of the supra-vaginal cervix—that is to say, the tumour was a retroperitoneal cervical fibroid. Several portions of the tumour had



FIG. 85.—RETROPERITONEAL CERVICAL FIBROID. SIDE VIEW. (Case of M. H.)
B. Body of uterus ; T T T. tumour ; O. ovary.

become cystic, and some of these cysts were opened in the course of the operation in order to make the mass smaller. They contained thin bloody fluid. The whole mass, consisting of the body of the uterus and tumour, was then cut away, leaving the vaginal portion of the cervix. The remaining portion of the cervical canal and external os uteri were sufficiently opened so as to admit the finger. A few ligatures were required to control bleeding from the cervical stump. These were passed so as not

to occlude the lumen of the cervical canal. A large number of ligatures were required to secure bleeding points at various parts of the "bed" from which the tumour had been dissected. A sterilized gauze drain was passed through the cervix into the vagina, and the peritoneal flaps were sutured together over the stump and over the end of the gauze drain projecting from it. A second gauze drain was also left in the lower angle



FIG. 86.—RETROPERITONEAL CERVICAL FIBROID.

The uterus is seen to the front, little, if at all, enlarged. The whole of the tumour lay behind and below the peritoneum. Douglas' pouch is thus carried up so as to lie high in the abdomen. There was no pelvic peritoneum at all. The highest point of the tumour marked the epigastrium ; the lowest part completely filled the pelvic cavity. The patient made a good recovery.

of the abdominal wound, the rest of which was closed in the usual way.

The patient ultimately made a good recovery, and left the Hospital on July 22, 1902. There was moderate fever for the first three weeks after the operation, probably due to imperfect drainage.

She came up to see me at the Hospital some months afterwards, and

I examined her. The scar was quite sound, and the sinus at the lower end of it had healed completely. She had resumed her regular work.

Note on the specimen (Figs. 84 and 85).—It was examined immediately the operation was over. It consisted of the body of the uterus and part of the cervix, both sets of uterine appendages, and of a mass of very irregular form attached to the lowest part of the uterus. The body of the



FIG. 87.—INTERSTITIAL CERVICAL FIBROID.

Specimen removed by abdominal hysterectomy. The uterus has been laid open posteriorly. There is a large ovoid interstitial cervical fibroid measuring 4 in. × 3 in. developed in the anterior wall of the cervix, vaginal portion and supra-vaginal portion. The thinned crescentic posterior lip of the vaginal portion is seen retracted to each side of the middle line after opening up the uterus posteriorly. The right uterine appendages are seen attached to the specimen.

The patient was 37, and for two years suffered from menorrhagia, and sometimes metrorrhagia. There was constant desire to pass water, sometimes difficulty in passing it, and for a long time she had slight incontinence of urine, so that she was always wet, and constantly wore a diaper. She made a good recovery after the operation. The patient was sent to me by Dr. Black of March.

uterus was uniformly enlarged. Its extreme length was about 8 inches, its greatest width about 7 inches, and its greatest thickness from before back about $3\frac{1}{2}$ inches. On section a small fibroid was found in the anterior uterine wall. The left ovary was enlarged to about three times

its normal size. The irregular mass which formed the tumour was attached to the back of the cervix, and perhaps partly also to the lowest part of the body of the uterus. Its greatest diameter was 13 inches; the greatest thickness from before back was about 8 inches. From the surface several cysts were seen projecting, varying in size from that of an orange downwards. The lowest part of the mass was cone-shaped, and was the

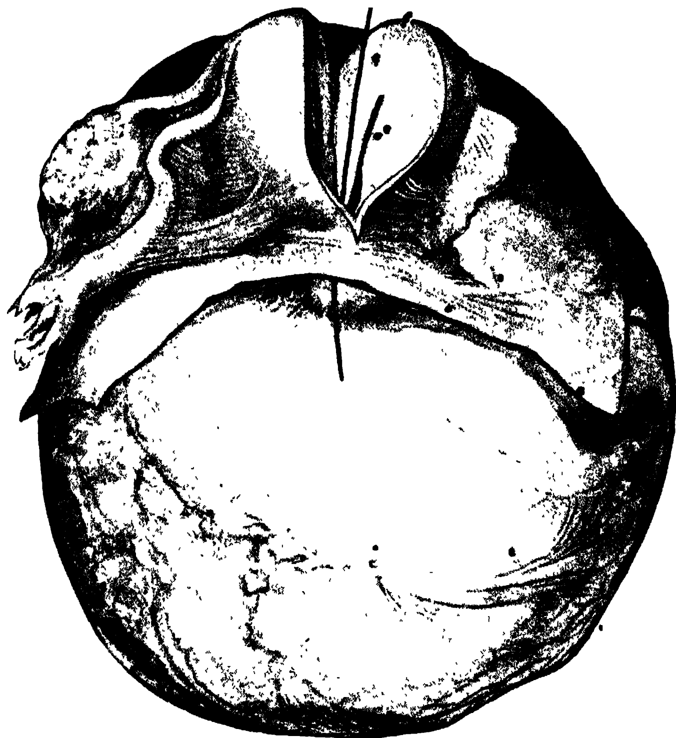


FIG. 88.—INTERSTITIAL FIBROID OF THE CERVIX—POSTERIOR WALL.
The extremely thin anterior cervical wall is well seen. The body of the uterus is practically unaltered. The tumour measured 7 in. vertically, 5 in. transversely, and 3 in. from before back. The patient made an uninterrupted recovery.

part of the tumour pressing down the posterior vaginal wall. The mass weighed 13½ lb.

(The specimen was shown at a meeting of the Medical Society of London on March 9, 1903.)

Structure.—Fibroid tumours are composed of involuntary muscular fibre and fibrous tissue, in varying proportions.

As regards consistence they may be either :—

1. *Hard*, or

2. *Soft*.

1. *Hard fibroids*.—These are much more common than soft, and in them there is an excess of the fibrous tissue element, with a comparatively small amount of involuntary muscle. To the naked eye, a hard fibroid has, on section, a greyish-white colour, with a pearly lustre, and owing to the wavy arrangement of the fibres, its appearance has been aptly compared to that of a ball of cotton. As the bundles of fibres may be arranged round several centres, an appar-

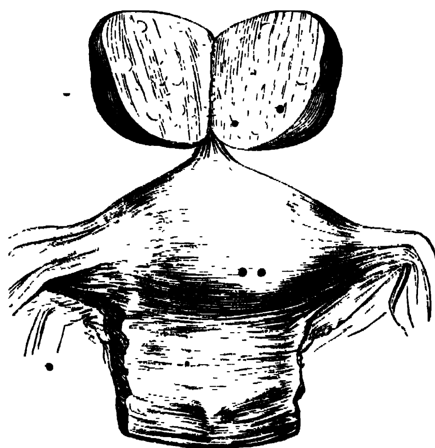


FIG. 89.—SUBPERITONEAL FIBROID TUMOUR OF THE UTERUS (London Hospital Museum).

The tumour is only attached by a thin pedicle to the fundus uteri (Barnes).

ently single fibroid may, on section, have an appearance like several balls of cotton placed in contact with one another. Hard fibroids have a sort of capsule formed of the tissues of the uterus in which they are embedded, and they are connected with their capsules by a loose connective tissue, which permits a tumour of this variety to be easily shelled out when the capsule has been divided. The vessels supplying a hard fibroid lie under the capsule round the circumference of the tumour. From these vessels small branches are given off, running towards the centre of the mass.

2. *Soft fibroids*—the rarer variety—have no distinct capsule, their tissues being continuous at the circumference with the tissues of the uterus. They have a pale pink colour. Microscopically they are found to have an excess of involuntary muscular fibre, with but little fibrous tissue.

Adenomyoma.—This is a form of innocent new growth in which glands are found lying at various points in the



FIG. 90.—LARGE RETROPERITONEAL CERVICAL FIBROID, SPRINGING FROM THE POSTERIOR ASPECT OF THE CERVIX.

Body of uterus little altered. The whole mass weighed 9½ lb. The patient made a good recovery.

substance of the myomatous tissue. Clinically, as regards symptoms and signs, these growths resemble soft fibroids. A tumour of this kind may occur as a localized swelling in the wall of the uterus, or there may be diffuse thickening of the uterine wall throughout. To the naked eye the cut section of such a tumour presents numerous little pits scattered over

the surface. Under the microscope these cavities are found to be lined with columnar epithelium similar to that lining the endometrium, and no doubt derived from it. The substance of the tumour in which these glands are embedded is composed of myomatous tissue. (See Figs. 93 and 94.)

Degenerations and other changes to which fibroids are liable.—The majority of the changes which take place



FIG. 91.—LARGE INTERSTITIAL FIBROID, SHOWING COMMENCING CYSTIC DEGENERATION.

The cut surface is studded with small cavities. As the process continues, these coalesce to form larger cavities, and so on, till perhaps a single large cavity only may remain.

in these tumours may be ascribed to some alteration in the blood-supply.

Œdema.—Obstruction to the veins may cause a fibroid to become œdematous, and in such cases there is often visible œdema of the broad ligaments, and some free fluid in the peritoneal cavity. Rarely a subperitoneal fibroid with a sufficiently long and narrow stalk may have its pedicle twisted, as so often happens in cases of ovarian tumour; the result, if the twist is at all tight, is to cause the tumour to

become purple, or almost black. I have myself removed a fibroid in this condition due to a twisted pedicle.

Mucoid, *hyaline*, and *fatty* degeneration also occur. The result is to produce cavities in the tumour, which may contain jelly-like or fluid material, which may be green or yellow. As these degenerations progress, large cavities may



FIG. 92.—SPECIMEN REMOVED BY ABDOMINAL HYSTERECTOMY FROM A PATIENT UNDER THE AUTHOR'S CARE IN THE LONDON HOSPITAL.
The large fibroid tumour, which has been cut open, is seen to have undergone extensive cystic degeneration at its upper part.

be formed producing a result which has sometimes been ascribed to a definite cystic degeneration. As a rule the walls of such cavities are not lined by endothelium. When they are, the cavities are to be looked on as dilated lymph spaces.

Red degeneration.—Sometimes on section a fibroid shows

PLATE VII.

UTERUS REMOVED BY SUPRA-VAGINAL ABDOMINAL HYSTERECTOMY.

A. Rounded adhesion, the result of a previous hysteropexy by another operator, attaching the uterus to the anterior abdominal wall.
B. Small subperitoneal fibroid cut across.
C. Uterine cavity.
D. Fibroid undergoing red degeneration.

PLATE VII



To face page 207

a sharply defined area, or patch, of a brownish red, or dark red colour like raw meat. This is said to be characterized by thrombosis of vessels, together with fatty and hyaline degeneration. This degeneration is said to be especially frequent in fibroids removed during pregnancy, or soon after. That it may occur, however, in fibroids removed quite apart from any pregnancy is certain, and of this I have seen several instances myself. Clinically tumours showing this form of degeneration are very liable to be associated with acute symptoms, such as pain and septic disturbances.



FIG 93—ADENOMYOMA OF UTERUS.
From a specimen in the London Hospital Museum A micro-photograph of a section of the growth is shown in Fig 94.

Necrosis en masse.—Occasionally, as a result of sufficient interference with its nutrition, a fibroid may necrose as a whole. It soon becomes infected, and at times, under favourable conditions of position, an opening may form towards the endometrium, and the tumour together with pus be discharged, a natural cure resulting. I have described above a case where this occurred some nine weeks after delivery. Up to the time the tumour was discharged the patient was seriously ill with high fever, occasional rigors, &c. After

the tumour was expelled, together with several ounces of fœtid pus, convalescence was at once established, and about eighteen months later the patient had twins.

Calcification.—Fibroids are sometimes found with considerable deposits of lime salts scattered through the substance of the tumour. At times the deposit may affect the surface only, forming a superficial shell to the underlying tumour. At times the whole substance of a tumour may be calcified, producing what has been called uterine calculus.

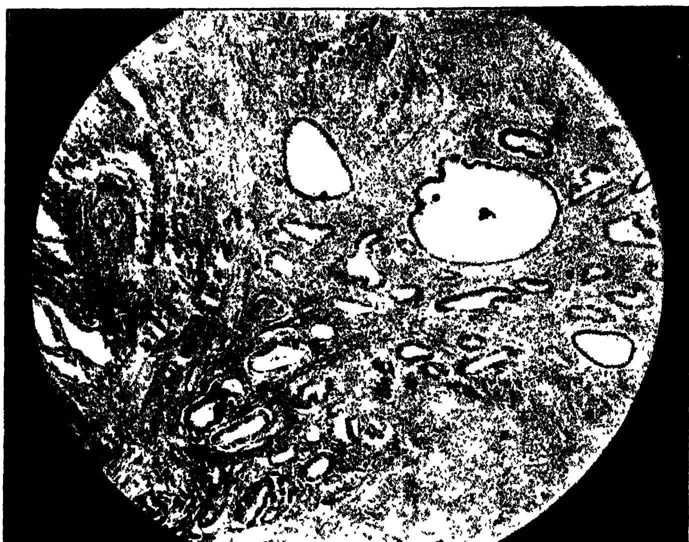


FIG. 94.—ADENOMYOMA UTERI. (*Micro-photograph.*)
The section shows groups of endometrial glands (some of which are cystic) passing into the deeper muscular layers of the uterine wall. Accompanying the glands is a cellular stroma in which they lie, corresponding to (but more richly developed than) the interglandular stroma of the normal endometrium.

Malignant degeneration.—It is very doubtful whether a fibroid ever undergoes malignant degeneration. What is certain, however, is that fibroids are frequently found in uteri affected by carcinoma of the body, suggesting that the conditions which favour the production of fibroid tumours, may also favour the development of carcinoma of the body. On the other hand, carcinoma of the cervix is very rarely seen in cases of uterine fibroids.

Influence of menstruation on fibroids.—Fibroids are at their largest immediately before the commencement of the flow, and at their smallest at the end of the flow; between the periods they gradually enlarge, attaining a maximum just before the next period.

Symptoms.—There may be none, and it is more particularly in the case of subperitoneal fibroids that this occurs. Subperitoneal fibroids are more likely to have attention directed to them on account of their size than on account of symptoms, such as occur with the other varieties of fibroid tumours. These are:—

1. *Bleeding.*—Menorrhagia, and perhaps also metrorrhagia.
2. *Painful menstruation.*
3. *A yellow discharge.*
4. *Pressure symptoms.*

Pressure symptoms.—In slight cases there is merely a sense of weight in the pelvis, with a feeling of "bearing down." More severe symptoms may arise: (*a*) if the tumour be of great size, or (*b*) even with a smaller tumour, if it become incarcerated in the pelvis.

Micturition.—Frequency of micturition is a common symptom. Retention of urine is not uncommon in cases of fibroids, where the tumour is of a size that enables it to fit rather tightly into the pelvic cavity. This symptom rarely occurs in cases of ovarian tumour.

Defæcation.—It is conceivable that complete obstruction might occur from the pressure of an incarcerated fibroid on the rectum. If, however, a woman is the subject of uterine fibroids, and intestinal obstruction occur, there is a strong probability against the obstruction being due to the fibroids. It is much more likely to be due to some other condition altogether, such as a malignant growth in the sigmoid flexure.

Pressure on veins may cause the veins of the lower extremities to become varicose, and there may also be some of the violet tinting of the vaginal mucous membrane from venous congestion, like that observed during pregnancy.

Pressure on nerves.—Severe neuralgic pains may occur, particularly in cases where the fibroid is incarcerated in the pelvis.

Pressure on the ureters occasionally causes them to

become dilated, and ultimately hydronephrosis may be produced (Fig. 99).

Finally, in the case of very large tumours, **respiration and digestion** may be interfered with.

Symptoms of infection.—A tumour which has undergone some of the degenerations described above, especially the so-called "red" degeneration, or a tumour which has become extremely œdematous, may easily be infected by micro-organisms. The result then will be to cause acute constitutional symptoms, such as pain, rigors, fever, and so on.

Diagnosis.—Fibroid tumours have to be diagnosed from:—

1. Pregnancy.
2. Ovarian tumours.
3. Pelvic inflammation.
4. Pelvic hæmatocele.
5. Retroflexion and anteflexion.
6. Some cases of carcinoma.

1. **Pregnancy.**

As regards the history.—In pregnancy there is usually complete amenorrhœa, whereas in fibroids there is generally menorrhagia. Sometimes, however, menstruation may go on during the first three months of pregnancy; and even as late as the fifth or sixth month there may be hæmorrhages at intervals of a month, which the patient takes for ordinary menstruation. The explanation of hæmorrhages so late as this is probably that there is really a threatened miscarriage each month, and that the bleeding occurs at intervals of a month on account of the monthly congestion of the uterus, which probably continues even during pregnancy.

Again, there is a history of morning sickness, and if the pregnancy has reached the end of the fourth month, the history of quickening, whereas in fibroids these symptoms are absent.

Physical signs.—Supposing the tumour in the abdomen is up to the umbilicus, if it be the pregnant uterus it feels elastic, and has a uniform outline and surface, and we may feel it alternately harden and soften; if it be a fibroid of the common hard variety, it feels hard, not elastic, and as fibroids

are usually multiple, the tumour will probably have an irregular outline and surface; even if there is only one fibroid, it is only rarely situated so centrally as to have the symmetry of the pregnant uterus at the fifth month, though this does happen sometimes. Again, on auscultation, we



FIG. 95.—Uterus containing Fibroid Tumour, from a case which terminated fatally through hæmorrhage. Large venous sinuses are seen in the capsule, one of which ruptured at the point (a) (Matthews Duncan).—*Edin. Med. Journ.*, 1867, p. 634.

may expect to hear the fœtal heart-sounds if the child is alive; we may also hear the uterine souffle, but this is of less value, as it is often heard over fibroid tumours. Still, a well-marked souffle is very suggestive of pregnancy.

Practically, the greatest difficulty arises in cases where, with no history of amenorrhœa, there is a tumour in the abdomen rising out of the pelvis, and reaching perhaps up to the umbilicus, centrally situated, soft and elastic, and evidently connected with the uterus, and yet over which no fœtal heart-sounds can be heard.

The tumour may be a *soft* fibroid of the uterus; or it may be the pregnant uterus, the fœtus having died, the ovum being for some reason retained—the woman, in fact, being in a condition of "missed" abortion, or rather, at this period, of "missed" miscarriage; or, again, the case might be one of hydatidiform mole; or it might be a case of placenta prævia.

As regards other points to which attention must be paid, there is the woman's own opinion, either that she is, or is not, pregnant, which is worth something, but not much. Patients are often mistaken in this matter, the non-pregnant thinking herself pregnant, and the pregnant woman having no idea of her condition.

The condition of the breasts, the purple colour of the vaginal mucous membrane, and of the vaginal portion of the cervix, the softening of the cervix, are all signs to which due weight must be given; but it must be borne in mind that there may be fluid in the breasts of a woman who is not, and never has been, pregnant; that the purple coloration of the vagina is mainly due to pressure, and may, therefore, be caused by other tumours; and that the cervix may be softened in some cases of fibroid tumours.

As a matter of experience these cases almost always turn out to be cases of pregnancy—threatened or "missed" abortion, or miscarriage; hydatidiform mole; or placenta prævia.

Finally, it must not be forgotten that both conditions may be present together—normal pregnancy and fibroid tumours of the uterus.

In such cases, however, there is amenorrhœa, the uterine tumour is probably irregular in outline and surface, and is larger than would correspond to the supposed period of pregnancy; for certain diagnosis we must wait until the fœtal heart is heard.

I remember a case very well, where a woman who had been a widow for some years, and was over forty years of

age, came with a history of three months' amenorrhœa, and where there was an elastic irregular tumour connected with the uterus much larger than the uterus at the third month of pregnancy. The tumour rapidly enlarged, and finally, when it was several inches above the navel, after about five months' amenorrhœa, we heard the fœtal heart. At this time the surface of the tumour was markedly irregular, some three inches of the upper part being hard, and separated by a deep transverse groove from a soft and more uniformly regular, lower portion, which was no doubt the body of the uterus containing the ovum.

Hegar's sign of pregnancy.—Where the size of the uterine

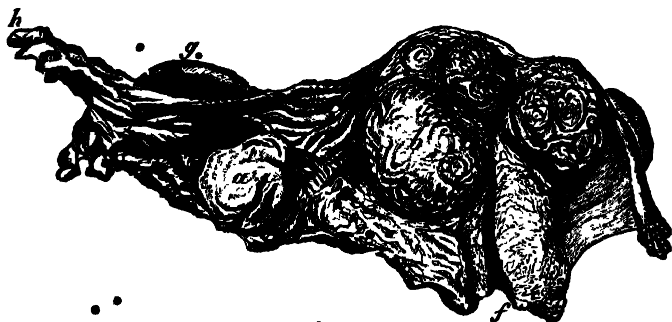


FIG. 96.—MULTIPLE FIBROIDS OF THE UTERUS (Winckel).

a. Fibroid tumour in right broad ligament. *b* and *e.* Subperitoneal tumours. *c.* Interstitial fibroid. *d.* Submucous fibroid. *f.* External os. *g.* Right ovary. *h.* Right Fallopian tube.

Note how the uterine cavity is encroached upon, and rendered unsymmetrical by the projection of the tumours.

tumour does not exceed that of the pregnant uterus at the fourth month, Hegar's sign of pregnancy is of much value in differential diagnosis. This sign depends on the fact that in pregnancy from about the sixth week onwards the segment of the uterus at about the level of the internal os, that is the part at the junction of the cervix with the body of the uterus, becomes markedly softened. To obtain the sign the left hand is placed on the abdomen, and is pressed down so as to be on the *posterior* aspect of the uterus at the level of the internal os. The index finger of the right hand in the vagina is pressed upwards towards the anterior aspect of the uterus

at the corresponding level—that of the internal os. When Hegar's sign is well marked, the fingers of the two hands seem almost to meet, as if the cervix were separate from the swelling formed by the body of the uterus. Indeed, it is said that sometimes the cervix has been mistaken for the whole uterus, and the enlarged body of the pregnant uterus for a tumour separate from the uterus, such as an ovarian tumour, in cases of pregnancy where the observer has not been aware of the conditions on which Hegar's sign depends. The sign is available from the sixth to about the sixteenth week. After that time it is generally impossible to get the upper hand depressed sufficiently low behind the uterus to recognise the sign.

2. **Ovarian tumours.**—It has already been said that soft fibroids which feel elastic and almost fluctuating (and which are therefore more likely to be mistaken for ovarian tumours) are comparatively rare. Again, hard, solid-feeling tumours of the ovary are rare, and, when they do occur, are likely to be mistaken for the common hard fibroid, especially the subperitoneal fibroid with a long stalk. Nevertheless, as a general rule, great importance should be attached to the consistence of the tumour. The late Dr. Barnes said, "If you find a smooth *solid* tumour, beware; it is uterine."

This dictum remains true so far as it suggests that a solid tumour arising from the pelvis is probably uterine, and due to fibroids.

Though, of course, it is always desirable to make as accurate a diagnosis as possible, the consequences of mistaking a uterine fibroid tumour for an ovarian are very different nowadays, when abdominal hysterectomy for fibroids has become so nearly on a level as regards risk with ovariotomy, from what they were when Dr. Barnes wrote the sentence quoted above.

As regards history, while menorrhagia is the rule with fibroids, it is the exception with ovarian tumours; but still we must remember that in cases of ovarian tumour, both small and large, profuse menstruation does occasionally occur; more commonly, however, menstruation in cases of ovarian tumour is not excessive, and either regular, or if its regularity is disturbed, it is in the direction of amenorrhœa,

the intervals between the periods being increased, and the flow lasting for a shorter time, or being less in quantity, than formerly.

On vaginal examination, in cases of large ovarian tumour, the finger, as a rule, reaches the vaginal portion of the cervix easily, often more easily than usual, because the whole uterus is often somewhat pushed down by the pressure of the tumour; it is exceptional for the cervix to be drawn up, so that the os is only reached with difficulty, or not at all, though this does occur sometimes. In large fibroid tumours, on the other hand, it often happens that the vaginal portion of the cervix cannot be reached with the finger, sometimes being so drawn up that even when a full-sized Fergusson's speculum has been passed to its full extent, it is yet an inch or two too short to bring the os into view.

In less extreme cases the vaginal portion may be drawn up so that the os is flush with the vaginal roof.

I remember a case of Dr. Graily Hewitt's of this kind, where the sound could only be passed through a speculum, as the situation of the os could not be detected by the finger alone.

The sound, held by the handle in a long pair of cervix forceps, then passed till only the handle was left projecting beyond the os uteri.

The sound.—As a rule in cases of ovarian tumour the sound passes only the normal distance; whereas in cases of fibroids it passes more than two and a half inches, often much more, as in the case just mentioned. In rare cases the uterus is stretched upwards by the growth of an ovarian tumour adherent to it, and then we do have moderate lengthening of the uterine cavity, the sound passing three or four inches. This is, however, quite the exception.

The bimanual examination.—In cases of large abdominal tumours this often gives no additional information.

When there is a large solid, or chiefly solid, ovarian tumour, it is apt to be mistaken for a uterine fibroid. Sometimes in such cases the sensation imparted to the finger by tilting the cervix enables one to recognise that there is no such close connection between the uterus and the tumour as there would be if the tumour were a uterine fibroid. While the finger

touches the cervix it is useful in such cases to have the abdominal tumour pulled upwards as much as possible by an assistant. This may show the tumour to be not so closely connected with the uterus as a uterine fibroid would be.

There are other points that help one in a difficult case, For example, a large tumour that has grown rapidly, if it be a fibroid of the uterus, is almost certain to be attended with a good deal of menorrhagia, and again, the sound will usually pass much more than the normal distance. In the following case the tumour had been previously diagnosed by another gynæcologist as a uterine fibroid, and it had been treated by the Apostoli treatment before it came under my observation.

Sarah V., aged 35, married seventeen years, five children, the last eight and a half years ago, came under my observation at the London Hospital on August 11, 1889. She had then been in the Hospital about five weeks.

History of the illness.—She was under medical treatment in March and April of this year, "suffering from pain in the abdomen with sickness and swelling of the abdominal walls." I have ascertained that she was then supposed to be suffering from chronic constipation, and that the swelling was believed to be a fæcal accumulation.

The swelling in the abdomen was first noticed about Christmas, 1888.

Since April she had been in good health, but the swelling in the abdomen had not lessened; indeed, she thought it had gradually increased in size since it was first noticed (Christmas, 1888).

For about eleven weeks previous to the time I first saw her she had been losing too much. During the time she had been losing too much she had had constant pain in the abdomen. The pain was not confined to one place; sometimes it was in the right iliac region, at other times in the left groin.

Menstrual history.—The catamenia appeared when she was sixteen years and two months old; she was regular every four weeks, the flow sometimes lasting a week, but unaccompanied by pain.

Since the birth of her last child, eight years ago, till last Christmas she was quite regular. From Christmas till the end of March the flow came on every fortnight without pain. Somewhere about April or May she went over the month without seeing anything. She was then feeling well and free from pain.

There had been no inter-menstrual discharge.

Other symptoms.—Micturition had been slightly painful the last eleven weeks. Had had piles the last three months. Defæcation had been somewhat difficult since the present illness began. She thought she had been losing flesh during the last four months.

The patient told me she was sure that twelve months ago she was quite regular, and not losing too much.

Her weight on April 9, 1889, was 10 st. 9 lb.; on July 6 it was 10 st. 1 lb.

Present state, August 11.—The patient is not anæmic to any marked degree.

Abdominal examination.—A tumour is felt rising out of the pelvis, and reaching (measured with callipers) at the highest point, which is to the right of the middle line, a distance of 10¼ inches above the upper margin of the pubic symphysis.

The tumour for the most part feels as if it were solid, but it certainly has in places an elastic feeling, though distinct fluctuation cannot be obtained.

The vaginal examination.—The vaginal portion of the cervix has its normal range of mobility, and on tilting it with the finger it gives the impression of belonging to a uterus the body of which is not much enlarged, and also the impression that it is not closely incorporated with the large tumour felt in the abdomen.

The sound passes three inches. While the sound was in the uterus the tumour in the abdomen was raised as much as possible away from the pelvis by an assistant. Doing this did not appear to alter the position of the sound in the least. I came to the conclusion that the case was one of ovarian tumour, probably of the semi-solid variety.

Operation, August 29, 1889.—On opening the abdomen a small quantity of fluid escaped. The appearance of the tumour was unlike that of a fibroid; and, on passing the hand in, the uterus could be felt to be of about the normal size, and quite distinct from the tumour.

Wells' trocar was thrust into a part of the tumour that seemed comparatively soft, but only a small quantity of dark grumous fluid came away. Accordingly, the incision was extended upwards to about three inches, or rather more, above the umbilicus, and the tumour was lifted out of the abdominal cavity whole. The peritoneum was washed out with weak iodine water, and a Keith's tube having been inserted, the wound was closed in the usual way.

The tube was taken out in thirty-six hours' time.

The patient made a perfectly satisfactory recovery. On September 2 the wound measured 7¼ inches.

Now, the points in the case which inclined me to believe that the tumour was not a uterine fibroid, but an ovarian tumour, were :—

(*a*) *As regards the history.*—The short time that had elapsed since the beginning of the illness. Before Christmas, 1888, the patient had been in her ordinary health, and noticed nothing amiss. Yet in August, 1889, we found a tumour in the abdomen about the size of the pregnant uterus at the eighth month.

The great probability would be that a uterine fibroid of

that size would have given rise to symptoms for two or three years or more.

(*b*) *As regards physical signs.*—The absence of anæmia; a uterine fibroid of the size and consistence (it was distinctly elastic in parts) presented by the tumour would probably have caused profuse hæmorrhage, and made the patient anæmic.

The feeling imparted to the finger on tilting the vaginal portion of the cervix gave the impression that the uterus had no close connection with the tumour, and was of the ordinary size. Again, the sound only passed three inches.

It may be objected that the tumour might in spite of this have been a subperitoneal fibroid connected by only a thin pedicle to the uterus; but the consistence of the tumour, apart from other features in the case, would be strongly against that view; subperitoneal fibroids of that kind are typically hard, unless they have undergone extensive cystic degeneration, which is relatively rare; and have a history extending over years, whereas in this case the tumour was distinctly soft and elastic in parts, and the history only extended over about eight months.

When the tumour is of moderate size, say reaching up to the umbilicus, or small and entirely in the pelvis, and the abdominal parietes are lax, then, in cases of ovarian tumour, we can often isolate the uterus by the bimanual examination from the tumour; whereas in ordinary cases of fibroids we should not be able to do this; the whole tumour would move on giving an impulse to the cervix. Very rarely a subperitoneal fibroid may be met with having a long thin stalk permitting us to isolate the uterus from it as completely as if it were an ovarian tumour.

Fibro-cystic tumours of the uterus cannot generally be diagnosed from ovarian tumours. They are extremely rare compared to ovarian tumours. The following case is an example of a large fibro-cystic tumour of the uterus mistaken for an ovarian tumour:—

Miss S., aged 45, was brought to see me by Dr. Warren, of Enfield Highway, in December, 1893. The abdomen had been noticed to be enlarging for about three years. Till two years ago the patient had been regular every four weeks, and always lost very little. For the last two

years she had not been regular. Latterly she had menstruated every fortnight, but the quantity lost each time had been very small. On examination there was found a thin-walled fluctuating swelling, reaching well above the umbilicus and rising out of the pelvis. The sound only passed two inches and a half. I diagnosed the case as one of ovarian tumour. At the operation, however, after tapping and emptying the cyst (which was unilocular, and contained a thin straw-coloured fluid) I found that both ovaries were normal, and that the tumour was uterine. The operation was undertaken at the patient's own house at Enfield Highway; fortunately I had the serre-nœud and transfixion pins with me,* and accordingly performed a supra-vaginal hysterectomy, fixing the pedicle externally in the lower angle of the wound. The pedicle so fixed was, of course, composed of uterine tissue, but I did not see the cavity of the uterus at all, and believed that it was not opened. The parts removed were the cystic tumour and a portion of the fundus of the uterus. The ovaries were so situated that there was no need to interfere with them. The patient made an absolutely uneventful recovery. The patient, when I last heard of her, had been regular since the operation. I showed the specimen at a meeting of the Obstetrical Society of London in October, 1894.

3. Pelvic inflammation.

History.—The symptoms would probably be found to date from either labour, abortion, or exposure during menstruation, or to have followed an acute vulvo-vaginitis, especially one of gonorrhœal origin—in fact, to have been preceded by some of the ordinary antecedents of pelvic inflammation.

The symptoms would be abdominal pain, perhaps vomiting, and more or less high fever.

Physical signs.—*Abdominal examination.*—In cases of pelvic inflammation, large hard swellings may be formed by the gluing together of the intestines and omentum by adhesive lymph. Such swellings have a less definite outline than swellings due to fibroids; they are also fixed, whereas fibroids usually admit of a certain amount of displacement. Again, in pelvic inflammation the tumour is tender, whereas in fibroids it is not tender.

Vaginal examination.—*Bimanual examination.*—In acute cases of pelvic inflammation the vagina will be found hot, and the uterus more or less fixed. Bimanual examination is often impossible on account of tenderness. In fibroids the vagina is not hot, and the uterus is not fixed—unless it

* This was in the days before hysterectomy with intra-peritoneal treatment of the stump.

happens that there are adhesions, which are rarely sufficiently extensive to fix the uterus completely, or unless lateral fibroid outgrowths have encroached on the broad ligaments, so diminishing, or obliterating, the amount of "slack" which allows the uterus to move.

In practice there is usually little difficulty in diagnosing fibroids from pelvic inflammation.

4. **Pelvic hæmatocele.**

History.—Here there is a history of sudden onset—pain in the lower abdomen coming on suddenly, with the appearance of a red or chocolate-coloured vaginal discharge, often when, as regards menstruation, the patient is a week or two over her time, with faintness, nausea, perhaps vomiting, followed, perhaps after twenty-four hours, by some fever. In fibroids there is no history of this kind; the symptoms present have usually all come on gradually.

Abdominal examination.—Hæmatocele may, if large, form a swelling reaching a variable distance upwards in the abdomen according to its size, say 3 or 4 inches above the pubes. Here there is tenderness, and the swelling is fixed.

Vaginal examination and bimanual examination.—The uterus, in hæmatocele, can often be isolated from the tumour, and is usually pushed close behind the pubes, and fixed there, partly by the pressure of the swelling, but chiefly by the adhesive peritonitis in the neighbourhood of the hæmatocele. After the first forty-eight hours, in hæmatocele, we usually have a hard swelling bulging down Douglas' pouch, and symmetrically situated as regards the middle line. The swelling cannot be displaced out of the pouch.

Here again, the only case of fibroids likely to give rise to similar physical signs is that where we have fibroids of the posterior wall incarcerated in Douglas' pouch, either by having grown so as to be fitted tightly into the pouch, or fixed there by pelvic peritonitis.

In practice cases of hæmatocele are more likely to be mistaken for solid ovarian tumours than for fibroids.

5. **Anteflexion and retroflexion.**—We have to be careful not to mistake anteflexion or retroflexion for small fibroids of the anterior or posterior uterine wall respectively.

Anteflexion.—Here the body of the uterus forms a swelling felt on vaginal examination in the anterior fornix; bimanually, the body can be grasped between the internal and external fingers, and its size, shape, and particularly its outline, regular or irregular, may be easily determined. If there were a fibroid in the anterior wall, the thickness of the body of the uterus from before back would be greater than normal; again, the outline of the anterior surface of the body of the uterus would be irregular, according to the extent to which the fibroid projected towards the peritoneal surface.

On passing the sound, and holding it in position, if the case is simply one of anteflexion, the tumour in the anterior fornix will be found to form a much less obvious projection than before; if an assistant holds the sound in place while a bimanual examination is made, it becomes evident, on grasping the uterus between the fingers, that there is only the thickness of the uterine wall between the sound and the anterior aspect of the tumour; and, further, after recognising by gently tilting the sound whereabouts its point lies, we can make out that there is no convex swelling on the anterior surface of the uterus below this level. Careful attention to these points will make the case clear.

Retroflexion.—Here the body of the uterus forms a swelling felt in the posterior fornix. On passing the sound it will be found to enter with the concavity backwards, and its point may be recognised as lying in the centre of the tumour with no more thickness of tissue between it and the examining finger than would be accounted for by the posterior wall of the uterus.

Again, by raising the uterus with the sound, the tumour will disappear from behind the cervix, and by completing the replacement we can feel the body of the uterus bimanually through the anterior fornix; previous to replacing the uterus we should have been able to make our fingers meet immediately in front of the vaginal portion, without anything like the body of the uterus between them.

If the tumour were a fibroid of the posterior wall:—

The sound would pass with the concavity more or less forwards, and by gently tilting the sound we could make out its point through the abdominal wall, while the tumour

was still to be felt, as distinctly as ever, in the posterior fornix.

DIAGNOSIS OF FIBROID POLYPI.

A. When they have passed the os uteri.

Malignant disease of the cervix.—This sometimes takes the form of a polypoid mass, perhaps the size of a large pear, which seems to spring from the vaginal portion of the cervix by a sort of a pedicle, thus simulating fibroid polypus of the cervix; if the mass is malignant, the pedicle is never so definitely circumscribed and distinct, as in a case of fibroid polypus.

Again, a malignant growth of this kind is soft, friable, easily bleeding when touched, whereas a fibroid polypus, unless sloughing, has a shining, pinkish capsule, and is of firm consistence; many other considerations would make the diagnosis clear, such as duration of the symptoms, &c., but the physical signs referred to are quite sufficient; even a fœtid, sloughing fibroid polypus is not generally so friable as a malignant growth, nor, on breaking it down, is there such free bleeding as in the case of the latter.

In certain rare cases, a malignant growth springing either from some part of the cervical canal, or even from the body of the uterus, may project through the external os uteri into the vagina. The nature of the growth is recognised by the characters just given—softness, friability, &c. Such growths may have a fairly distinct pedicle.

Inversion of the uterus.—It must be remembered that a fibroid polypus attached to the fundus may produce an inversion. So that both conditions may be present.

From inversion simply, we diagnose a fibroid polypus:—

1. *By passing the sound.*—In fibroid polypus we shall be able with care to pass the sound at least the normal distance, and usually farther. In inversion we shall be unable to pass the sound the ordinary distance, no matter on which side of the polypoid mass we try; this is mentioned because in some cases of fibroid polypi the pedicle may become adherent at some part of its circumference to the os, but it is always free at some part, permitting the passage of the sound.

2. *Bimanually*, if the case is one of inversion, we may make out absence of the body of the uterus from its usual position. With the sound in the bladder, and the finger in the rectum, *care being taken to keep the sound exactly in the middle line*, the absence of the uterus from its usual position can be made out.

3. *Inspection of the surface of the mass.*—The inverted uterus is red, and bleeds easily. The appearance of a fibroid polypus has just been mentioned above.

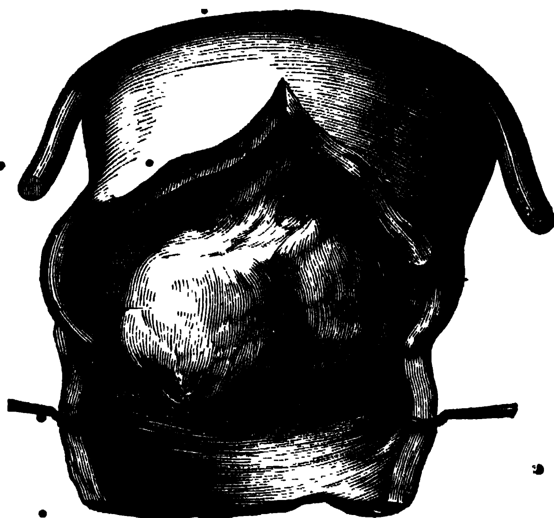


FIG. 97.—FIBROID POLYPUS OF THE UTERUS (Churchill and Leblond).

4. The mass formed by the inverted uterus is tender, while a fibroid polypus is not.

It is well to remember that inversion of the uterus is very rare, while fibroid polypi are common.

B. **When they have not passed the os uteri.**

If the os uteri is sufficiently dilated to admit the finger, the sensation imparted to it by coming on a hard, smooth, somewhat movable body within the uterus, combined with the presence of the fundus uteri in its usual position as ascertained bimanually, and also with the fact that the sound passes further than normal, will make the diagnosis clear.

If the os were not sufficiently open to allow the finger to pass, and a consideration of all the circumstances made it most probable that the enlargement of the uterus was due to the presence of an intra-uterine fibroid tumour, or fibroid polypus, the proper course to pursue would be to dilate the cervix sufficiently to admit the finger, and so settle the question.

Treatment.—This may be considered under two heads:—

1. When there is a submucous fibroid tumour, or fibroid polypus (for distinction between them see p. 193).

2. When the tumour is interstitial, or subperitoneal.

1. **As regards fibroid polypi** the right treatment always is to remove them, and the same is true of submucous fibroid tumours, which are attached by a narrow attachment, or neck, to the wall of the uterus, even though they have not yet acquired a distinct stalk.

When the polypus has passed the os uteri, it is a very easy matter, having seized it with the volsella, to cut through the pedicle with scissors. It is quite safe to do this, as no bleeding of any importance occurs. If, however, the polypus is still within the cavity of the uterus, and the os is just large enough to admit the finger, the case is a very different one. In such cases it is well to dilate the os further with Hegar's dilators. The ordinary series stops at No. 26. A larger series made for me runs up to No. 40, which is 1¾ inches in diameter. It is only rarely necessary to use a larger size than No. 20.

In all cases before commencing the operation the vagina should be thoroughly douched out with an efficient antiseptic *e.g.*, perchloride of mercury lotion 1-1000, and afterwards, if the operation has been intra-uterine, the cavity of the uterus should be washed out with iodine water (Tr. Iodi ʒij. to Oj. water) through the intra-uterine tube (Fig. 15, p. 31).

Morcellement.—It is often necessary to cut up a submucous fibroid *in situ* with scissors till the remaining portion is small enough to pass through the os uteri. Wedge-shaped pieces are cut out of the tumour successively till the necessary reduction in size has been brought about.

2. **When the tumour is interstitial or subperitoneal.**—If bleeding is the chief symptom, we may first try what large

doses of ergot will do, preferably using ergotine, gr. ij.-v., in the form of pill, thrice daily, or hydrastis canadensis (♏xx. of the tincture) thrice daily. The patient should be kept in bed while bleeding continues. She should also be advised to use vaginal douches of hot water twice daily.

Radical operations for uterine fibroids.—The indications for radical treatment may be the symptoms present, such as, for instance, menorrhagia, or pressure symptoms, especially retention of urine; or the mere presence of a mass of fibroids of a certain size may be the indication, even if no definite symptoms exist at the moment.

It should be noted that fibroid tumours as a rule grow slowly for the most part. The life-history of these growths may extend over many years. Therefore if left to run their natural course it rarely happens that one observer can see the whole progress of a case of fibroids from the time when the tumours are first recognised, or first produce symptoms, to the end of the case, apart from operation. While, as has been said, fibroids on the whole are characterized by slow growth, often with intervals during which they appear to be stationary, they may at times take on changes, whether of degeneration or by infection, or of growth, which rapidly cause acute symptoms, and put the patient's life in jeopardy. Such an acute crisis may easily happen in a patient known to have had fibroids for many years, but it is quite likely that when the acute crisis does occur she may not come under the observation of the practitioner or practitioners who have seen her during the earlier period of the case. Those who have happened only to see the case during its quiescent and comparatively harmless phases may never know what the termination has been, and, if they happen to bear the case in remembrance at all, may think of it as an example of the satisfactory results of expectant treatment.

Formerly the mortality of abdominal hysterectomy for fibroids was very high, and accordingly patients were naturally averse to radical operation, if it could possibly be avoided. The profession, for the same reason, also were unwilling to recommend it till everything else had been tried without avail. The very most was made of the fact that in some cases, especially with small tumours, there is

a tendency after the menopause for the tumours to shrink, and for symptoms to disappear, or to be ameliorated, at all events for a time. On the other hand, the existence of fibroids undoubtedly postpones the occurrence of the menopause, and tumours may often, even after the menopause, cause fresh trouble by undergoing degeneration and infection. Further, uteri with fibroids, in patients of fifty-five years old and upwards, seem to be specially liable to carcinoma of the body.

During the last two decades great progress has been made in improving the results of radical operation for fibroid tumours of the uterus. This has been partly due to the improvement that has taken place during the period in question in surgical methods generally, especially in the matter of asepsis, and partly to the greatly improved technique of the operation itself. Whereas twenty years ago, and before that, the mortality of abdominal hysterectomy for fibroids was 20 per cent., and often considerably more even than that, it may be taken that the mortality at the present time should not exceed 5 per cent.—provided large series of consecutive operations are taken into account, and provided the operator has had a large experience.

As regards my own recent experience of abdominal hysterectomy for fibroids: between April 3, 1901, and December 31, 1911, the total number of cases in which I performed abdominal hysterectomy was 328; in most the operation performed was supra-vaginal hysterectomy, in a minority panhysterectomy. Although I say 328 cases, the number in which hysterectomy was actually completed was really 326, as, unfortunately, two cases died under the anæsthetic, while an ordinary, uncomplicated hysterectomy was in progress, and before it was completed. Excluding, therefore, these two cases, I had 326 cases with 15 deaths—a mortality of 4·6 per cent.

Reflections of this kind are suggested by such cases as the three about to be recorded. In each of them the tumours must have been present for many years, and during the greater part of the time presumably symptoms were either absent, or slight. Similarly, during the greater part of the time the general health was not seriously affected, and the

tumours might no doubt have been removed at a very slight risk. While I do not advocate removing fibroids of the uterus when they are really small, and causing no symptoms, I do think that once they have reached a size equal to that of the pregnant uterus at the end of the third month, for instance, even apart from any marked symptoms, it is safer for the patient to have the growths removed. The popular impression that these tumours may be expected to give no trouble after the menopause is certainly often wrong. Quite recently, for instance, a patient, 65 years of age, was admitted under my care into the London Hospital, suffering from metrorrhagia and other symptoms. On dilating the cervix a submucous fibroid of the size of an orange was found in the uterine cavity. It was removed by cutting it away piecemeal, and the patient did well. I have seen many other cases where serious symptoms have been caused by fibroids long after the menopause.

NOTES OF SOME CASES OF FIBROID TUMOUR OF THE UTERUS SPONTANEOUSLY FATAL.

CASE I.—*Case of fibroid spontaneously fatal from hæmorrhage.*—The patient was a married woman, aged 47, who had had three children, the last in 1895, and who was admitted under my care into the London Hospital on April 4, 1908. Up to two years previously the catamenia had been regular and normal; since that time the periods had been more frequent and profuse. The patient was admitted from the out-patient department, where she had come complaining of flooding, and fainting attacks, for the previous three days. During vaginal examination in the out-patient department a severe hæmorrhage occurred, necessitating immediate plugging of the vagina with gauze before the patient could be removed into the wards, where she was admitted at 4 p.m. At 8 p.m. on the same night the gauze plugging was gently removed. A fresh alarming hæmorrhage started. The vagina was again plugged, but the patient never recovered from the effects of the hæmorrhage; she shortly became delirious, and died from gradual heart failure secondary to the hæmorrhage on April 8. As regards the treatment adopted after her admission, saline injections per rectum were given freely, but they proved useless.

Post-mortem examination.—The pelvic cavity is occupied by a smooth rounded mass 4 inches in diameter lying below and in front of the uterus, and springing by a pedicle from the anterior lip of the cervix (Fig. 98). The bladder is pushed upwards and forwards; it is flattened from side

to side, and the posterior wall is bulged forward; the rectum is similarly compressed, and its anterior wall is pushed back. Vagina: On opening the vagina a large mass is seen distending it, having a diameter of 4 inches. High up posteriorly is seen the external os, the posterior lip of the cervix being thin and crescentic. On section, the tumour shows well-defined white fibrous strands and reddish-brown areas enclosed between them. A capsule is distinctly seen loosely attached to the surface of the tumour. At its lower vaginal pole the capsule shows several small ulcerated areas,



FIG. 98.—LARGE FIBROID POLYPUS SPRINGING FROM ANTERIOR LIP OF CERVIX.

Vagina opened posteriorly to show the position of the growth. The patient died of hæmorrhage; no operation; specimen obtained post-mortem. (Case I.)

which have encroached on the venous sinuses of the capsule. Numerous thrombi occupy those ulcerated patches, which have evidently been the source of the hæmorrhage. There is no marked myocardial degeneration, in spite of the grave general anæmia. With the exception of œdema of the lower lobes of the lungs, and some muco-purulent secretion in the bronchioles, there are no other outstanding pathological lesions of importance.

CASE 2.—*Case of fibroid spontaneously fatal from pulmonary embolism.*—The patient, a single woman, aged 42, was admitted into the London Hospital under my care on June 25, 1909. She complained of a lump in the abdomen, which she had noticed for eighteen months, and which had been slowly growing; also of micturition being frequent, and on two occasions there had been actual retention. There was said to have been no menorrhagia. The patient was somewhat anæmic. On examination there was a firm median swelling in the hypogastric region, which could not be separated from the uterus on bimanual examination, and was taken to be the uterus enlarged by fibroids. The patient seemed to be in fair



FIG. 99.—FIBROID OF ANTERIOR WALL OF UTERUS AND CERVIX.
Ureters dilated by pressure. Severe hæmorrhage; sudden death, probably partly due to uræmia. (Case 3.)

general health on admission, except for the slight anæmia, and the presence of the tumour. On the day following admission she was said to have had a kind of "fit." She became suddenly rigid and cyanosed, and fell back dead. She was quietly reading in bed at the time when the seizure occurred.

Post-mortem examination.—This showed the uterus to be considerably enlarged by an interstitial fibroid in the anterior wall, forming the hypogastric "tumour" found on examination. It measured 7 inches in diameter, and had a circumference of 20 inches. The fibroid was soft and of a beefy-red colour—an example of "red" degeneration. The

cause of death was found to have been pulmonary embolism. A laminated friable clot, 2 inches in length, was found blocking the pulmonary artery at its bifurcation, and extending a short way along the left pulmonary artery. The clot was found to have originated on a valve at the end of the left iliac vein, where an adherent grey clot was found filling the lumen of the vessel, and extending a quarter of an inch in the direction of the blood-stream. Both ureters were dilated so as to be half an inch in diameter. The pelvis of each kidney was also largely dilated.



FIG. 100.—FROM A CASE OF FIBROIDS SPONTANEOUSLY FATAL.

Uterus opened, showing fibroid (in section) springing from anterior wall of uterus and cervix. Uterine cavity seen to the left was 7 inches long. (Case 3.)

CASE 3.—*Case of large interstitial fibroid of the uterus; sudden collapse, heart failure, and death.*—The patient, a widow, aged 41, was admitted under my colleague, Dr. F. J. Smith, on the morning of January 28, 1910. She had had one child eight years ago.

History.—She had had a severe flooding in June, 1909, and bleeding had continued on and off, clots occasionally being passed, till January 24, 1910. On this day, while at the sewing-machine, a severe flooding came

on. The medical man who was sent for to see her advised her immediate removal to the London Hospital. On admission she was very much collapsed, but was temporarily revived by saline injections, and strychnine hypodermically. A catheter specimen of the urine was examined, and contained no albumen. On the afternoon of the 28th I was asked to see her. She was so much collapsed that anything like a complete examination of the case was impossible, but a large tumour was noticed in the abdomen reaching considerably above the umbilicus. She was transferred to the gynæcological ward at 7.45 p.m. on the same evening. The pulse then was very weak and running. She was profoundly anæmic, and respiration was sighing. At 8.30 her condition became very much worse, and her pulse was then uncountable. She was treated with saline injections per rectum, also with coffee and brandy per rectum, but she died on the same evening. No hæmorrhage had occurred since her admission into the Hospital.

Post-mortem examination.—A large fibroid tumour lies in the anterior wall of the uterus and cervix; its lower pole is impacted in the pelvis, its upper pole rises several inches above the umbilicus; the terminal 2 inches of each ureter are seen firmly compressed between the fibroid behind and the body wall of pelvis in front (Figs. 99 and 100). Above this point the ureters are tortuous, and dilated to the calibre of the forefinger. The pelves of both kidneys are thin and dilated, and both kidneys are hydronephrotic. There are extreme anæmia and œdema of both kidneys. The bladder is very slightly dilated; its base is thin. The majority of the muscle is drawn up and retracted to the fundus of the bladder. The ureters are easily canalized at their terminal portions by a fairly large probe. On the left side there is a small hæmatosalpinx. The right and left ovaries are atrophied, with a small hæmorrhage cyst in the left ovary. There are some chronic fibrotic tubercles in both apices with caseous nodules; fibrous adhesions are present over the whole of the left lung and at the right apex. There are anæmia and œdema of all the organs.

Case of Fibroid Tumour of Uterus Spontaneously Fatal from Hæmorrhage.

Case 4.—Miss C., aged 39, said to be suffering from a large fibroid. I saw her in consultation on July 22, 1890. Her chief trouble had been with the water; twelve months ago she had retention of urine, and a catheter had to be used. The urine escaped on walking. She was regular every month; the period lasted eight to nine days; there was a good deal of pain latterly at the periods in the stomach and back.

The periods only lasted five days till a year ago. She had a yellowish-white discharge between the periods. There was a large irregular tumour to be felt in the abdomen, reaching above the umbilicus. As she was very nervous, and the bowels were greatly loaded, it was decided to examine her under chloroform a week later, the bowels to be thoroughly cleared out in the meantime. This was accordingly done, and on July 29 a complete examination under chloroform was made. The tumour felt

in the abdomen was uterine, the os uteri was high up close to the pubes, the anterior lip being thin and crescentic, the posterior lip deformed by the presence of a large interstitial cervical fibroid. The sound passed several inches (6 or 8).

Patient was a stout-looking woman, and not the least anæmic. I advised palliative treatment,* ergot, hot douching, &c. If she held her ground, well and good; if not, then the question of operative treatment was to be considered.

About four weeks later she suddenly became much worse, a great deal of hæmorrhage occurring. Her doctor asked me then to take her into the London Hospital with a view to operation; but her condition rapidly (within two or three days) became so much worse that he thought she could not bear the journey, and she died a day or two later, hæmorrhage being the cause of death.

The case is remarkable on account of the rapidity with which the patient, who was enjoying average good health when I saw her, passed into, first a serious, and then a hopeless condition. I think most probably a large venous sinus must have ruptured, as in the specimen shown in Fig. 95, p. 211, and in Fig. 98.

The radical operations performed by abdominal section for fibroids are:—

1. Myomectomy.
2. Supra-vaginal abdominal hysterectomy.
3. Panhysterectomy.

1. **Myomectomy.**—This operation is only available in a small minority of cases. For it to be a satisfactory operation there must be only one or two fibroids; further, each tumour must be so situated as to be capable of being enucleated after incision of its peritoneal covering and capsule. The bed of the tumour left after enucleation has then to be sutured from the bottom in such a way as to leave no spaces in the depth of the wound, and in such a way also as to effectually stop all bleeding. When it is remembered how often fibroid tumours are multiple, it will be seen how rarely myomectomy can be a complete cure in cases of fibroids. On cutting up a uterus affected with fibroids after removal, there are often to be seen small tumours, the size of a pea and upwards, entirely embedded in the thickness of the uterine wall, so as to be quite unrecognisable by the mere inspection and palpation that can be employed during an operation. Yet each of these is a potential source of future trouble. Hence after

* This was more than twenty years ago.

an apparently successful myomectomy with removal of one or more obvious tumours we can never feel sure that small undiscovered fibroids may not be present, and give rise to fresh symptoms at a future time, and perhaps necessitate another operation.

2. **Supra-vaginal hysterectomy.**—When a radical operation for uterine fibroids is indicated, abdominal hysterectomy with intra-peritoneal treatment of the cervical stump is the operation which I myself prefer. The technique of the operation is as follows :—

Hysterectomy with intra-peritoneal treatment of the stump.—In this operation the abdomen is opened in the

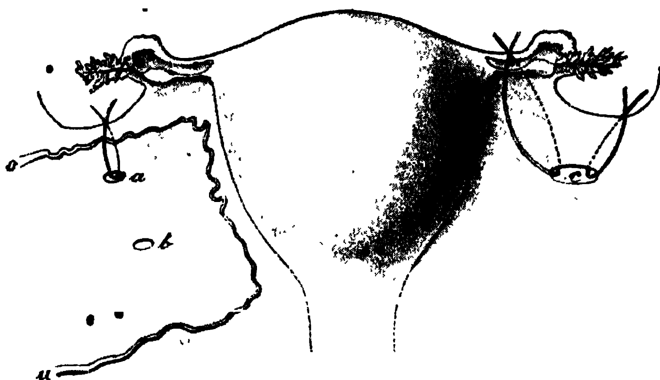


FIG. 101.—INTRA-PERITONEAL HYSTERECTOMY.

usual way. The uterus is then, if possible, brought outside. The first step is to ligature and divide the round ligaments on each side. The ovarian vessels are next secured, the position of the ligature varying according as it is desired to leave the corresponding ovary, or not. In Fig. 101, at *a*, a small hole has been made in the left broad ligament, and a ligature passed. On the opposite side a further stage is shown, the opening in the broad ligament having been stretched by opening a pair of Wells' forceps in it to the dimensions shown at *c*. The object is to have room to tie a second ligature as there shown, to prevent reflux bleeding from the uterine side when the tissues between the ligatures have been divided.

At *b*, Fig. 101, a second hole lower down in the broad ligament is shown ready to be treated as in the other case, so as to secure a further segment of the broad ligament. In Fig 102 several further stages are shown. On the reader's left in the figure the highest set of ligatures securing the ovarian vessels has been tied, and the tissues divided. The second pair of ligatures are passed ready for tying. On the reader's right in Fig. 102 the second set of ligatures has been tied, and the part of the broad ligament intervening between them divided. The next step is to make peritoneal flaps

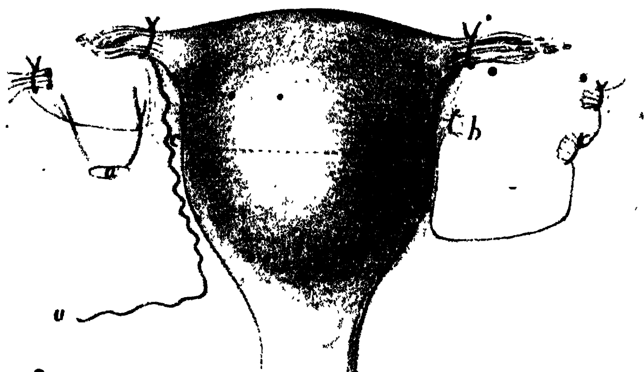


FIG. 102.—INTRA-PERITONEAL HYSTERECTOMY.

in front and behind. This is done by running the knife across the uterus in front and behind at the level of the dotted line *c*. The knife is only to cut through peritoneum. Great care must be taken here not to injure the bladder. In cases where the position of the bladder is doubtful, it is better to make this anterior incision from the insertion of one round ligament to the other. The anterior flap should then be carefully turned down and the bladder cautiously separated from the anterior aspect of the cervix. The posterior flap of peritoneum need only be separated down for about a quarter of an inch.

The posterior flap desired is much less extensive, and the

line of incision to make it should be only a quarter of an inch or so above the level of the internal os.

The next step is to tie the uterine artery on each side. This is shown in Fig. 103 diagrammatically. The pedicle needle used to pass the ligature for securing the uterine artery should be passed close to the cervix from before back. On the reader's left the ligature passed ready for tying; on the right, the ligature tied. This ligature should not include peritoneum. Often the uterine artery can be recognised, and tied separately. When the ligatures on the uterine arteries

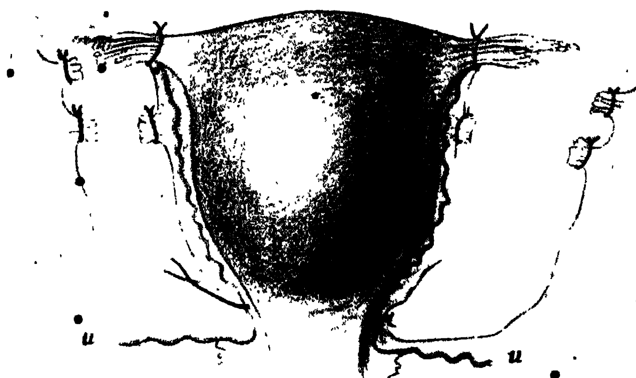


FIG. 103.—INTRA-PERITONEAL HYSTERECTOMY.

have been tied, the body of the uterus is cut away—a little above the level where the ligatures on the uterine arteries have been tied. Fig. 104 roughly represents the condition of things at this stage in antero-posterior section through the middle of the stump. *C a*, *c a*, are the peritoneal flaps. The shaded triangular area indicates a conical piece of the cervix, including the mucous membrane of the cervical canal, which I always cut out of the stump. The mucous membrane thus removed is not generally infected, though it may be, and on that ground alone cutting out this cone-shaped piece of the cervix is an advantage. Another advantage is that it leaves a surface of raw cervical tissue, free from mucous membrane, which can readily be sutured with silkworm-gut sutures passed

from before backwards, so as to unite by first intention. After cutting out the cone-shaped piece of the cervix and before passing the silkworm gut sutures, it is well to pass a strong straight needle in a handle through the stump from before backwards to one side of the middle line, and thread it with stout silk. This ligature is tied so as to secure the stump of the uterine artery on its own side. It also checks bleeding

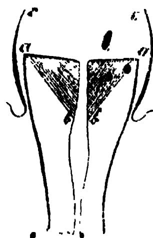


FIG. 104.—INTRA-PERITONEAL HYSTERECTOMY.

from any small vessels on the surface of the stump. This is done on each side.

The final step is to stitch the peritoneal flaps together over the stump, so that, at the end of the operation, there is seen a transverse line of sutures across the floor of the pelvis, running from the neighbourhood of the ligatured ovarian vessels on one side to the corresponding point on

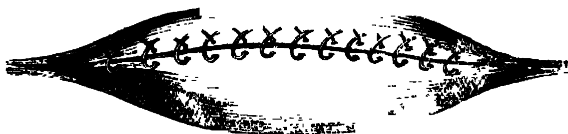


FIG. 105.—INTRA-PERITONEAL HYSTERECTOMY.
Appearance of stump at the end of the operation.

the other side (Fig. 105). This peritoneal suture should be so managed as to cover in the stump of the ovarian vessels and that of the round ligament on each side.

It is desirable in performing this operation to leave one ovary. This is of course done by passing the first ligature internal to the ovary intended to be left instead of external to it. If both ovaries are healthy, both should be left.

The abdominal wound is then closed. (For general technique as regards abdominal section, see chapter on Ovariotomy.)

3. **Panhysterectomy.**—In this operation the uterus is removed entirely from above, the cervix as well as the body. The earlier steps—the turning out of the uterus, the securing of the upper parts of the broad ligaments—are much the same as in the operation just described.

An incision is then carried across the anterior surface of



FIG. 106.—PANHYSTERECTOMY (Christopher Martin).

the tumour transversely at a safe distance from the bladder. The knife only goes through peritoneum and the tissue immediately under it. This flap is then stripped down, and the bladder separated from the anterior aspect of the cervix, and from the upper inch or so of the vagina. The experienced operator can readily recognise when the vaginal wall has been reached, and may incise it directly without any guide. The beginner will find it an advantage to pass a pair of Wells' large pressure forceps up the vagina just in front of the cervix. The vagina is then opened from above by cutting on these forceps. The finger is then passed through the

opening into the vagina, and used to push up the posterior vaginal fornix, which is then opened on the finger in the middle line. The uterus is still attached on each side by the lower segment of the broad ligament containing the uterine artery. The next step is to tie the uterine arteries. It is necessary to keep close to the uterus to avoid the risk of tying the ureters; but, on the other hand, these must be sufficient tissue beyond the ligature to prevent it slipping. The uterus is now cut away. Any bleeding points on the

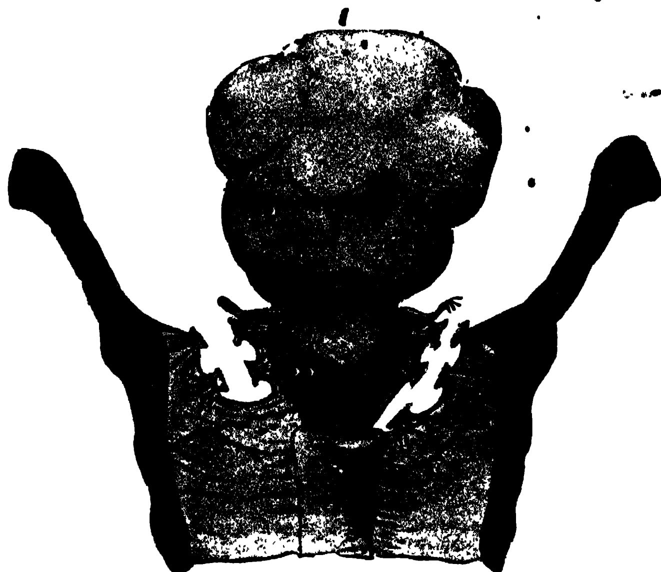


FIG. 107.—PANHYSTERECTOMY (Christopher Martin).

cut vaginal walls are tied. The ligatures on the upper part of the broad ligament are cut short. A thin piece of sterilized gauze is pushed down into the vagina. I leave it just level with the cut upper end of the vagina. The peritoneal flaps are then sutured together so as to cover all stumps and raw surface, and shut off the peritoneal cavity completely from the operation area. The abdominal wound is then completely closed in the usual way without drainage of the peritoneal cavity. Fig. 110 represents a specimen removed by this operation.

Panhysterectomy by the combined method.—This appears

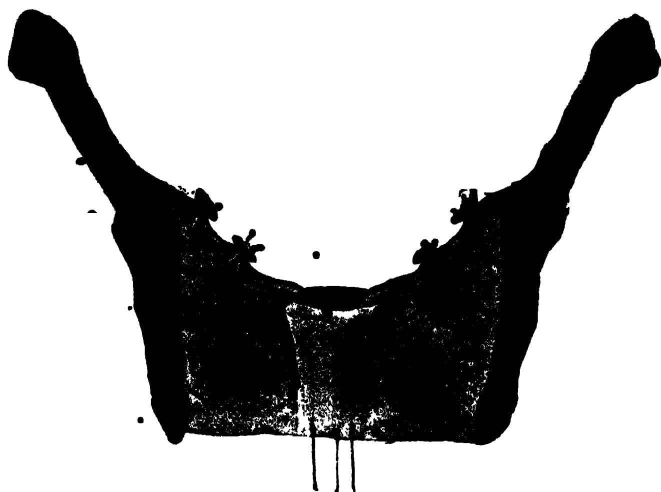


FIG. 108.—PANHYSTERECTOMY (Christopher Martin).
The ligatures on the uterine arteries are shown left long and drawn into the vagina. It is better to cut these short at the time, as described in the text.



FIG. 109.—PANHYSTERECTOMY (Christopher Martin).

to offer no advantages over panhysterectomy performed entirely from above. Fig. 111 is a drawing of a uterus with fibroids, which I removed by this method in the London Hospital in 1896. The abdomen was first opened, and the

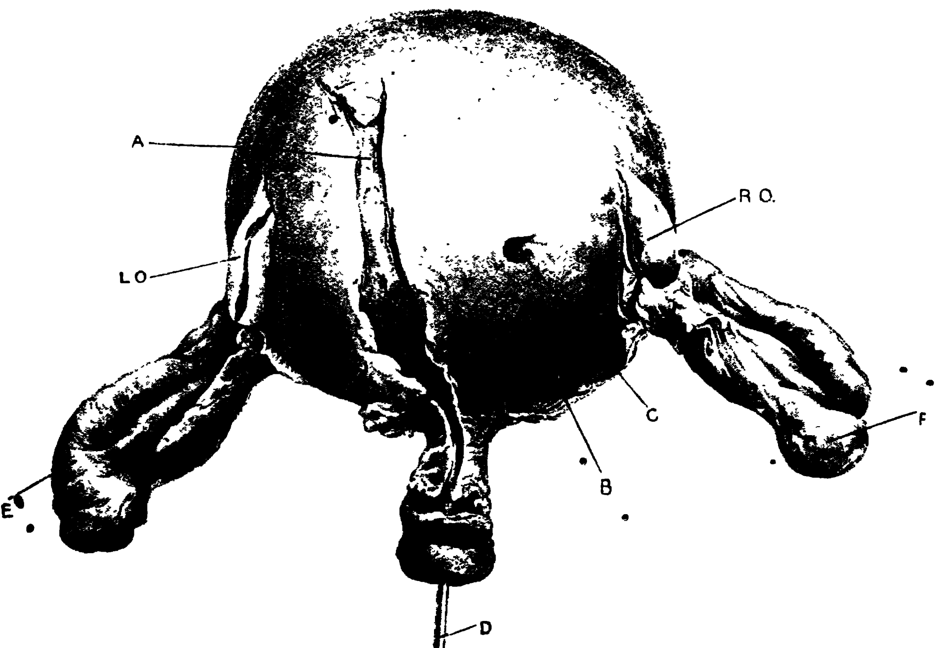


FIG. 110.—UTERUS WITH FIBROIDS, REMOVED BY ABDOMINAL PANHYSTERECTOMY (POSTERIOR ASPECT).

A. Uterine cavity. *B*. Cut edge of peritoneum on posterior surface. *C*. Place where the uterus was seized with a volsella. *D*. Probe passed through the external os uteri, and showing the cervical canal laid open. *E*. and *F*. The uterine appendages. *L. O.* Left ovary. *R. O.* Right ovary. (Case of Mrs. G.)

body of the uterus with the tumour removed. The abdominal wound was then closed. The patient was put in the lithotomy position, and the cervix removed per vaginam. Convalescence was tedious, owing to swelling of the left lower limb. The patient ultimately did well, and was able to follow her usual occupation.

As a rule, supra-vaginal abdominal hysterectomy seems

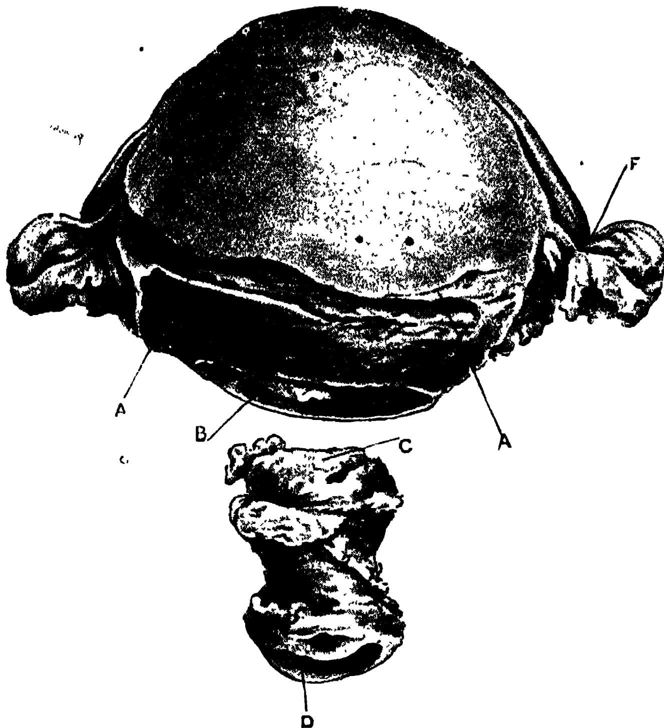


FIG. III.—UTERUS WITH FIBROIDS, REMOVED BY COMBINED PANHYSTERECTOMY. (Case of Mrs. D.)

A. Cut edge of peritoneum. *B*. Surface left when the uterus was cut off from the cervix. *C*. Upper limit of cervix. *D*. Os externum. *F*. Ligature on uterine appendages, to control reflux bleeding during the operation.

to me to be preferable to panhysterectomy, as a routine operation for fibroids requiring radical treatment. In cases where there is evidence of infection, and of course in cases where a malignant growth exists either in the cervix or body

of the uterus, removal of the whole uterus is the operation to be performed.

I omit from the present edition a description of the electrical (Apostoli) treatment for fibroids, which had a considerable popularity some twenty-three years ago. Its popularity was no doubt partly due to the high mortality which then prevailed for abdominal hysterectomy. Now that the death-rate of this operation in experienced hands is very low,



FIG. 112.—HYPERPLASTIC GLANDULAR GROWTH OF ENDOMETRIUM ASSOCIATED WITH MULTIPLE FIBROIDS. (*Micro-photograph.*)

There is relatively an increase of glands to stroma in the field. The glands show in places projections into the lumina covered by normal epithelium. Section transversely through the glands at these sites gives the appearance of a double lumen, as seen in two places in the section. The stroma is infiltrated with blood.

Clinical note.—The patient was 44. Four children, one miscarriage. There were multiple uterine fibroids causing menorrhagia for the year before she was seen. Abdominal hysterectomy.

it may be taken that cases of uterine fibroids requiring active interference should be treated by abdominal hysterectomy.

In many cases of fibroids the endometrium becomes much hypertrophied and vascular. Fig. 112 represents the appearance of a section taken from a thickened endometrium in a

case of multiple fibroids. It is in cases of this kind that curetting sometimes produces an improvement as regards menorrhagia—generally, however, for only a short time.

CASE OF PELVIC ABSCESS IN AN UNUSUAL POSITION, SIMULATING SOFT FIBROID TUMOUR OF THE UTERUS.

E. M., aged 36, married, having had eight children and three miscarriages (all before the fourth child was born), was admitted into the London Hospital on June 23, 1885, complaining of a swelling in the abdomen, and of a red discharge from the vagina. Her last labour (four weeks previously) was a quick one; she lost a good deal of blood after the child was born, but otherwise the labour was quite normal, and she seemed to recover as usual, getting up on the tenth day, without having any pain, shivering, or feverishness since her confinement. On the tenth day when she got up she noticed the swelling in the abdomen for the first time; it was then much smaller than it was on admission, but had gradually increased to its present size. On the day she got up she felt so weak that she was obliged to return to bed. When she moved, even in bed, she had a dragging pain in the hypogastrium, but she had no pain so long as she lay still. She had had a red discharge from the vagina ever since her confinement.

On admission the patient was thin and anæmic. The abdomen was somewhat distended. A smooth, elastic swelling was felt rising up from the pelvis to the level of the umbilicus; it was not tender. The swelling was symmetrically situated with regard to the middle line. It was dull on percussion; laterally, beyond the limits of the swelling, the abdomen was resonant. Nothing could be heard on auscultation over the tumour. The patient was put under the influence of ether in order that the relations of the swelling might be more thoroughly determined. Through the speculum a sanious discharge was seen to be issuing from the os externum. A catheter having been passed to make certain the bladder was empty, a swelling was felt in front of the cervix depressing the anterior fornix.

Bimanually this swelling was found continuous with that already noted in the hypogastric region. The uterus was movable; every upward impulse given to the cervix moved the tumour with it. The body of the uterus could not be made out distinct from the tumour. It was thought that the latter extended rather farther towards the left than to the right. The sound was not used on this occasion. The temperature was 101·4° on admission, and varied for some six weeks subsequently from 102° at night (on one occasion 103·5°) to 99° in the morning.

On *July* 13 the sound was passed; it reached a depth of three inches and a half, and passed towards the right. The tumour was thought to be a soft fibroid.

August 13.—The patient had been treated since the last note with ergot, at first by the mouth, and afterwards hypodermically, without any

alteration taking place in the size of the tumour. A catheter being passed into the bladder, it was found per vaginam that it would be impossible to puncture the tumour in that situation without puncturing the bladder. An aspirator needle was therefore put into the swelling in the middle line, about midway between the umbilicus and the pubes, and a pint of extremely offensive pus drawn off, the tumour entirely disappearing. Five days afterwards the swelling was as large as at first; it was tapped again on August 22, and twenty-two ounces of pus were drawn off, similar in character to the last. After each tapping the abdomen was firmly bandaged.

29th.—The swelling has filled up again, and is, if anything, larger than ever. To-day an opening was made under antiseptic precautions into the swelling, the edges of the abscess wall stitched to the skin, and a large drainage-tube five inches long inserted.

From this time to September 15 the patient went on without a bad symptom, the temperature only once reaching 100°. The wound was dressed about every other day, the cavity of the abscess being washed out at each dressing with iodine water, and some iodoform placed in the deep end of the drainage-tube before re-inserting it. The discharge, which had at first been very offensive, became quite sweet. The abdomen was firmly bandaged after each dressing, large pads of lint being placed on each side of the wound.

On *September* 15, at 9 a.m., the patient had a rigor lasting seven minutes, the temperature rising to 101°. She complained of pain in her limbs and sore throat. The pulse was very small and frequent (148). There was no pain in the abdomen, and the wound was looking well. There was a slight erythematous rash on the chest and arms. In the absence of any other discoverable cause, it was thought that these symptoms were due to the absorption of iodoform, which had been very freely introduced into the abscess cavity. The cavity was therefore washed out with carbolic lotion, and iodoform and iodine water omitted. The next day the temperature was normal, and all the symptoms had disappeared.

November 9.—The temperature had remained normal since the last note. The drainage-tube (which had been shortened from time to time, and replaced by a narrower one) was left off altogether to-day. Since October 5 the patient has gained eleven pounds in weight. She feels and looks very well. On November 4 the catamenia came on, and ceased to-day, no red discharge having previously taken place from the uterus for more than three months. The uterus is freely movable, the body of it being drawn to the left side. The sound passes two inches and a half. There is still a small sinus, an inch and a half deep, in the abdominal wall, but there is little or no discharge from it. A fine probe, coated with silver nitrate, was passed into it.

December 31.—The patient has had a fortnight at Eastbourne. The sinus is the same length as before, but only admits a very fine probe. She says the last menstrual period lasted a fortnight, but otherwise she has remained quite well, and has maintained her weight.

The patient came to me some months afterwards, as she thought herself pregnant. She had been suffering from pains in the lower part of the abdomen, which she had never before had in her pregnancies.

On examination she was found to be about four months pregnant. The sinus in the abdomen had completely closed. I consider the pains were due to stretching of inflammatory

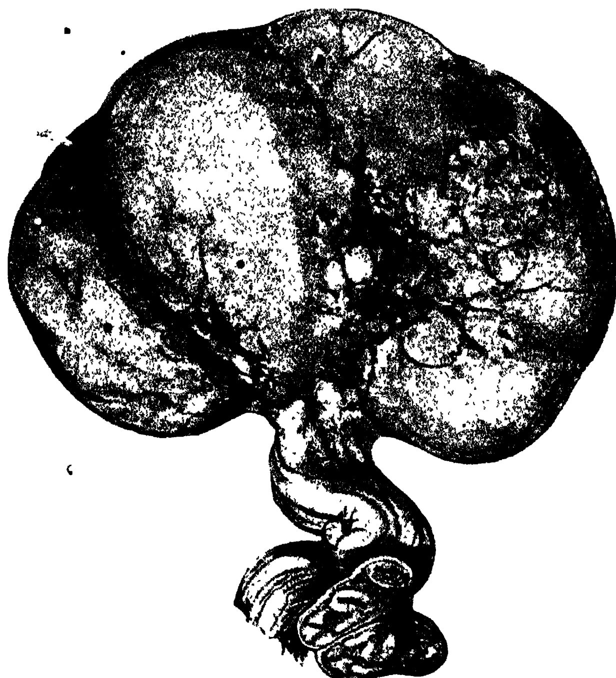


FIG. 113.—FIBROID TUMOUR OF BROAD LIGAMENT WITH TWISTED PEDICLE. The ovary is seen in the pedicle. The uterus was quite separate from the tumour.

adhesions round the situation where the abscess had been, as the uterus enlarged, owing to the pregnancy.

Fibroid tumours originating near the uterus, but not from it.—Occasionally fibroid tumours may originate from the round ligament (I have seen several examples of this) or from some part of the broad ligament. The tumours of the round ligament are not generally of large size ; those I have

seen have been from the size of a hen's egg downwards. On the other hand, fibroid tumours of the broad ligament may reach a large size, as big as the pregnant uterus at the fifth month, for instance. Occasionally they may acquire a pedicle, and then, as in the case of other pedunculated tumours, the pedicle may become twisted and cause acute symptoms. Fig. 113 shows a fibroid tumour of the broad ligament with a twisted pedicle, from a case on which I operated. There were numerous dense adhesions. The patient did well.

UTERINE POLYPI.

These are :—

1. **Fibroid polypi.**

2. **Mucous polypi.**—According to Matthews Duncan's classification, there are three varieties :—

(i) *Adenomatous*, where the polypus is composed chiefly of the hypertrophied glands of the mucous membrane.

(ii) *Molluscous*, where the polypus is formed chiefly by hypertrophy of the connective-tissue element of the mucous membrane.

(iii) *Cystic*, where retention cysts are formed from the uterine glands, either of the cervix or the body, and where the little mass resulting, composed of one or several retention cysts, acquires a pedicle.

3. **Placental polypi.**

4. **Fibrinous polypi.**

5. **Malignant growths of polypoid form.**

FIBROID POLYPI.

These have already been sufficiently considered under Fibroid Tumours, of which they are only a variety.

MUCOUS POLYPI.

Position. Size. Number.

Cystic mucous polypi are those containing spaces due to dilatation of glandular cavities.

The *adenomatous* and *molluscous* varieties are what are usually meant when mucous polypi are spoken of. They

occur both in the cervix and in the body, but are more common in the cervix, especially just within the os externum. They have a deep red colour during life, and are extremely soft to the touch.* Usually more than one is present at a time. They vary in size from that of a small raisin to that of a large strawberry.*

Mucous polypi are most commonly met with during

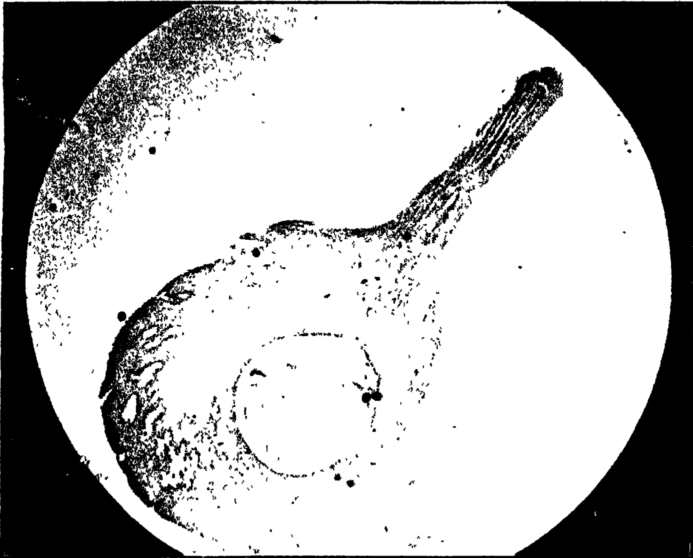


FIG. 114.—SECTION OF A MUCOUS POLYPUS PROJECTING FROM THE EXTERNAL OS, ATTACHED JUST WITHIN CERVICAL CANAL (× 10). (*Micro-photograph.*)

A loose fibrillar stroma is seen in which are embedded numerous racemose cervical glands, one of which, dilated and cystic, contains inspissated mucin. The outer epithelial surface is largely disintegrated. From a patient, aged 38, who complained of slight bleeding after coitus.

menstrual life—from fifteen to forty-five. Occasionally, however, they are found in women past the menopause. I have seen several cases of this kind.

* One of the largest I have met with was fusiform in shape. After several weeks in spirit its measurements were as follows :—length, 2⅝ inches; breadth, 1 inch; thickness, ½ inch. Before removal about half an inch of it projected beyond the vaginal orifice. It was attached to the cervical canal near the external os. There was a second one, the size of a cob-nut, attached near it.

Symptoms.—Small mucous polypi of the cervix hanging from the os externum are often discovered accidentally, having given rise to no trouble.

The symptoms likely to be present are :—

1. *Bleeding* (slight, especially likely to occur after coitus).
2. *A white or yellow discharge.*
3. *Sterility.*
4. *Dysmenorrhœa.*

And such symptoms, particularly the last two, may be

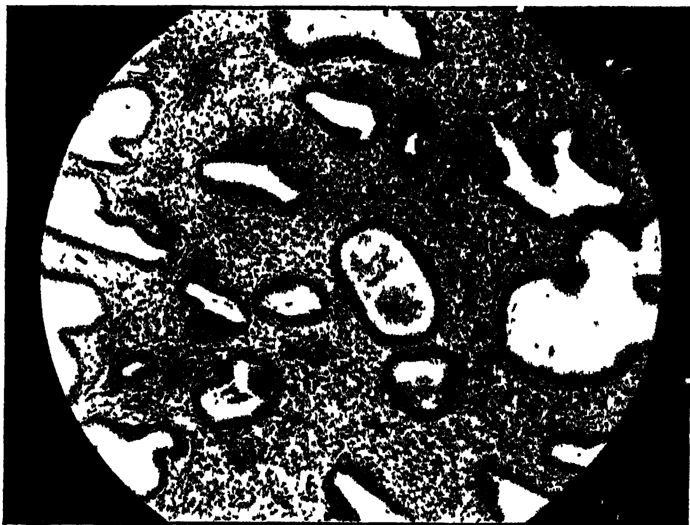


FIG. 115.—SECTION OF A MUCOUS POLYPUS REMOVED FROM THE BODY OF THE UTERUS. (*Micro photograph.*)

The section shows uterine glands, with a single layer of columnar epithelium separated by the meshwork of the inter-glandular stroma cells. Some of the glands are becoming cystic; others show projections of the lining membrane into the lumen. The polypus was discovered in the body of the uterus after hysterectomy for fibroids. It was of unusual size, measuring 3 inches in length. From a patient, aged 43—one child nineteen years ago, and one abortion nine years ago. History of menorrhagia for nine years.

considered due to mucous polypi with most confidence, when these are large and situated in the body of the uterus.

The bleeding in the case of mucous polypi is said to come from the polypus itself, but probably it comes also in part

from the general surface of the mucous membrane of the body of the uterus, at all events when the polypus is attached there. The white and yellow discharge is due to associated cervical or corporeal endometritis.

Diagnosis.—Mucous polypi hanging from the os externum are at once diagnosed by the finger, and brought into view with the speculum.

It is important to bear in mind that a polypus, whether



FIG. 116.—FOUR MUCOUS POLYPI GROWING IN THE CERVIX UTERI. (Sir J. Y. Simpson.)

mucous or fibroid, which is felt projecting at the external os at one examination may on another occasion not be felt, owing to the polypus having disappeared upwards into the canal of the cervix, or into the cavity of the body of the uterus, as the case may be. Want of knowledge of this fact may easily cause the practitioner who does not find the polypus to be unjustly blamed for not recognising it. I have seen many examples of this appearance and disappearance of

uterine polypi. Mucous polypi of the body of the uterus can only be recognised by dilating the cervix, and passing the finger into the uterine cavity. In fact, in cases of hæmorrhage coming from the cavity of the body of the uterus, apart from pregnancy, or any suspicion of malignant disease of the cervix or body of the uterus, we may say the general rule is:—(1) try rest, ergot, and hot vaginal injections; and if these fail after a fair trial, (2) dilate the cervix, and examine the interior of the uterus

Treatment.—Small polypi hanging from the cervix may be twisted off with a pair of tumour forceps (Fig. 117), which should have a catch like Spencer Wells' forceps; larger polypi may require to have their attachment cut through with scissors. I think the best plan, however, is always to cut off the polypus close to its attachment with scissors and touch the seat of its attachment with a fine point of Paquelin's cautery. If a polypus is *twisted* off, some may be left behind, and may grow again. I have seen several instances of this.

Intra-uterine polypi, recognised only after dilating the cervix, should either be twisted off with tumour forceps, or scraped away with a curette—antiseptic douches being given before and after the operation; the uterus itself should also be washed out afterwards with iodine water through the intra-uterine tube (Fig. 15, p. 31).

PLACENTAL POLYPI—FIBRINOUS POLYPI.

These are not the same. A *placental polypus* no doubt is usually in part composed of fibrin as well as of placental remains, but it has its origin in labour or abortion, some portion of the placenta or membranes remaining adherent to the uterus, and forming a base to which layers of fibrin attach themselves.

A *fibrinous polypus* may originate apart from labour or abortion: for instance, I have known it form after removal of a fibroid polypus attached to the body of the uterus, the fibrin being deposited on the stump left after section of the pedicle. In this case a highly offensive, yellowish, polypoid mass of fibrin protruded from the os externum some days

after the fibroid had been removed. Often fragments of the placenta left behind are sessile, attached to the uterine mucous membrane without any stalk.

Symptoms—Treatment.—Bleeding is the symptom that usually leads to investigation; and if the polypus is decomposing, there will also be an offensive discharge. On examination, the uterus will be found to be larger than

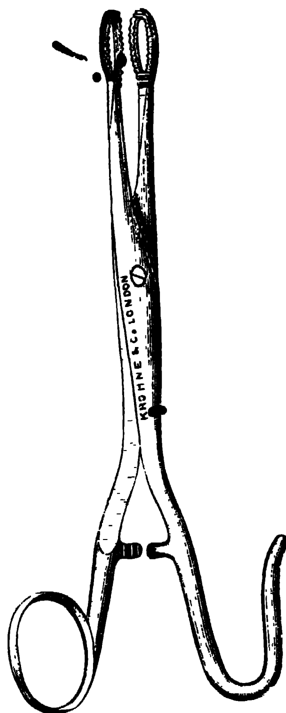


FIG. 127.—TUMOUR FORCEPS FOR TWISTING OFF SMALL POLYPI.

normal, and we may, perhaps, feel the polypus presenting at the external os, though this is far from being always the case.

The treatment consists in dilating the cervix, and scraping away the polypus thoroughly, or twisting it off, with all the precautions mentioned when describing the treatment of mucous polypi.

MALIGNANT GROWTHS OF POLYPOID FORM.

These were referred to when considering the diagnosis of fibroid polypi. A simple, non-malignant, papillary growth from the vaginal portion of the cervix has been described; but practically a papillary growth of the vaginal portion of the cervix that is soft, and bleeds easily on touching it, is almost invariably malignant. Malignant growths from the body of the uterus sometimes assume a polypoid form, and may occasionally project through the os uteri into the vagina. I have described further on a case in which I extirpated the uterus for a growth of this kind.

I have also met with a case of sarcomatous malignant growth, polypoid in form, growing from the vaginal portion of the cervix in a young unmarried lady only seventeen years of age. When I saw her, a black sloughing mass, the size of a duck's egg, projected from the vulva. There were several secondary growths in the vaginal walls.

CHAPTER XI.

Carcinoma of the Cervix.

Etiology.

Age.—It is to be noted that carcinoma of the cervix is not rare in comparatively young women; we meet with it sometimes even in patients of twenty-six or twenty-seven, and after thirty it becomes quite common.

I investigated the age-incidence in 100 cases of my own, made up as follows: 82 consecutive cases of advanced cancer of the cervix admitted under my care into the London Hospital, and 18 similar cases taken at random, but consecutively, from my private case-book. The actual results are of course also percentages.

Patients from 20 to 30 years of age formed	2	per cent. of the total.
" " 30 " 40 " " "	33	" " "
" " 40 " 50 " " "	34	" " "
" " 50 " 60 " " "	21	" " "
" " 60 " 70 " " "	10	" " "

According to this investigation it will be seen that the liability to cancer of the cervix is almost as great between thirty and forty as it is between forty and fifty.

Fertility.—Most cases occur in those who have had large families, but a case is occasionally, though rarely, met with in a nullipara.

In my own investigation on this point on the same series of 100 cases as that used for investigating the age-incidence, I found that 47 per cent. of the patients with cancer of the cervix had had five children and upwards, while only 13 per cent. had had no children.

For purposes of comparison I tabulated two separate series of 100 cases *other than those of cancer of the cervix* taken from my private case-book.

In the first series 11 per cent. only had had five children and upwards, while no less than 36 per cent. had had no children.

In the second series 15 per cent. only had had five children and upwards, while 25 per cent. had had no children.

Both tables, while differing slightly in detail, show clearly, when compared with the table of 100 cases of cancer of the cervix, how much more fertile patients with this disease are



FIG. 118.—Case 6.* The section, and the drawing of it, were prepared by the Clinical Research Association under Mr. Targett's direction. His report is as follows:—"The drawing shows thick branching processes of squamous-celled epithelioma dipping down into the fibrous substance of the cervix uteri. There is much small-celled infiltration of the tissues around the epithelial processes." The patient was known to be well twenty years after the operation.

than other gynæcological patients not suffering from cancer of the cervix.

Looking at the tables from another point of view, we find that the 100 women with advanced cancer of the cervix had had a total of 483 children, while in each of the series of

* The number refers to the Table of thirty-three consecutive cases of supra-vaginal amputation of the cervix for cancer in the author's monograph on "Cancer of the Uterus."

PLATE VIII.

SQUAMOUS-CELLED CARCINOMA OF CERVIX. (Case 19.*)

FIG. A.—Low power. It shows epithelial alveoli, of varying size and shape, which are invading the muscular substance of the uterus. The cells are arranged in a single row of columnar epithelium at the periphery, and towards the centre of the alveoli they become much more irregular and compressed. A few cell-nests are seen, and they are numerous throughout the section.

FIG. B.—High power. In this sketch one alveolus is represented made up of typical squamous epithelial cells. To the left a whorl of cells is seen in process of formation of a cell-nest. The vessels in the adjacent uterine substance are dilated. (Signed, J. H. Targett.)

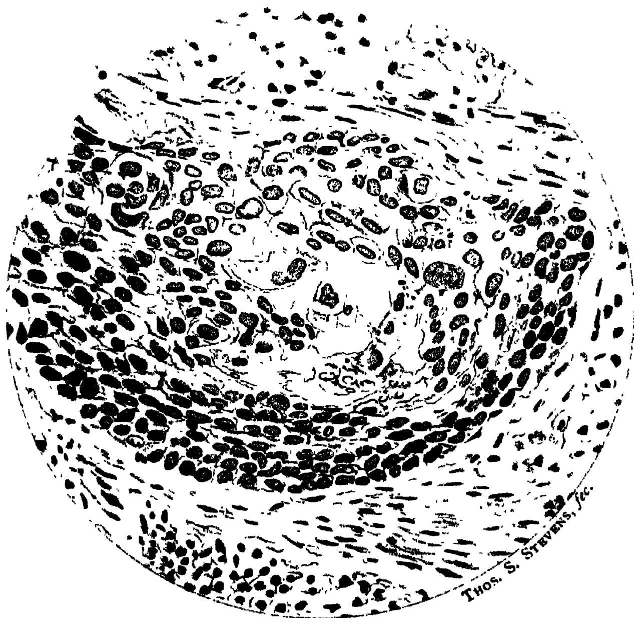
(The patient was examined, and found to be quite well seven years and four months after the operation.)

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* In the Table of forty consecutive vaginal hysterectomies performed for cancer. "Cancer of the Uterus," p. 224.

FIG. A





100 cases other than cancer of the cervix the total number of children is respectively 183 and 243.

How far, if at all, the lacerations of the cervix that occur during labour predispose to carcinoma is not yet decided.

Heredity.—The number of cases in which heredity can be traced is so small—only 7 or 8 per cent.—that it cannot be regarded as proved to have much influence. One argument in support of this view—namely, that heredity has

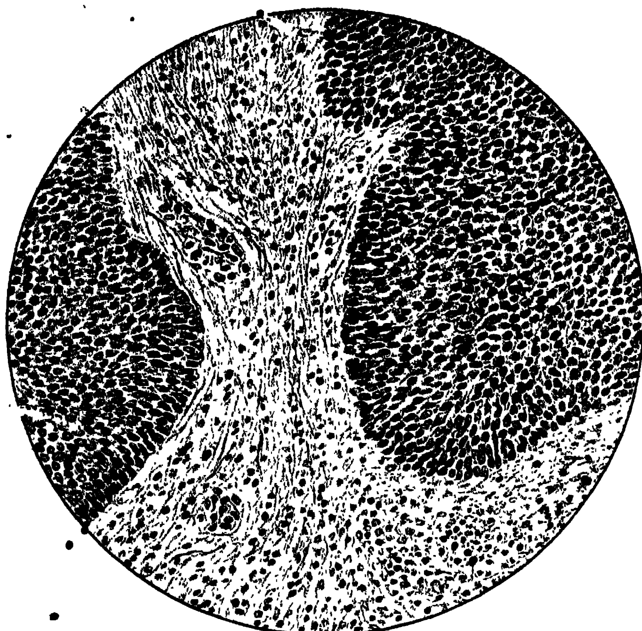


FIG. 119.—Section of growth in Case 17.* A columnar-celled carcinoma or malignant adenoma. The patient was known to be well twelve years after the operation.

little influence in predisposing to cancer of the cervix—is that considering, as we have seen, that patients with cancer of the cervix have (roughly) twice as many children as other women, cancer of the cervix should be a much more common disease even than it is if heredity played any important part.

* The number refers to the Table of thirty-three consecutive cases of supravaginal amputation of the cervix for cancer in the author's monograph "Cancer of the Uterus," p. 219.



FIG. 120.—SQUAMOUS-CELLED CARCINOMA. (Case 29.*)
Supra-vaginal amputation of cervix. Patient well Christmas 1911, more than fifteen years afterwards.

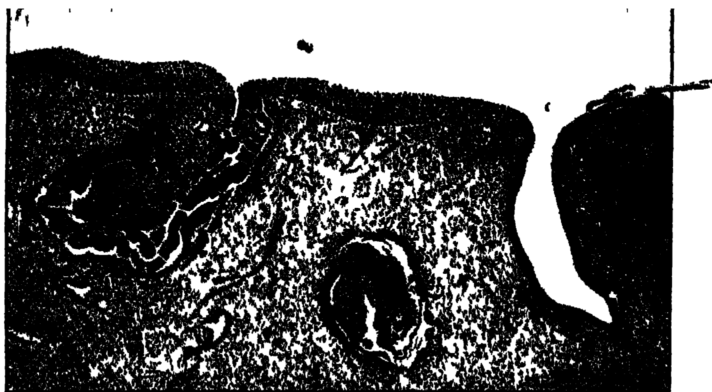


FIG. 121.—EARLY EPITHELIOMA OF CERVIX. (Case 33.*)
Supra vaginal amputation of cervix. Patient well twelve years afterwards.
Mr. Targett describes the section figured as follows:—"This is an early epithelioma of the cervix uteri. The section is taken from the portio vaginalis, and the drawing represents a down growth of the surface epithelium extending into the fibrous stroma of the cervix along the course of the glandular follicle. Embedded in the deeper tissues is the lower extremity of a similar epithelial down-growth, and some of the follicular lining persists."

* The number refers to the Table of thirty three consecutive cases of supra-vaginal amputation of the cervix for cancer in the author's monograph "Cancer of the Uterus," p. 219.

Race.—Carcinoma is much less frequent among the black races than among the white.



FIG 122—Cauliflower growth of the vaginal portion, forming a sessile patch, in an early stage. The aspect is that presented when the cervix was fully exposed with a speculum



FIG 123—Side view of cervix in Fig 122 after the cervix had been removed, showing the elevation of the sessile patch above the general surface of the vaginal portion. (Case 12 *)

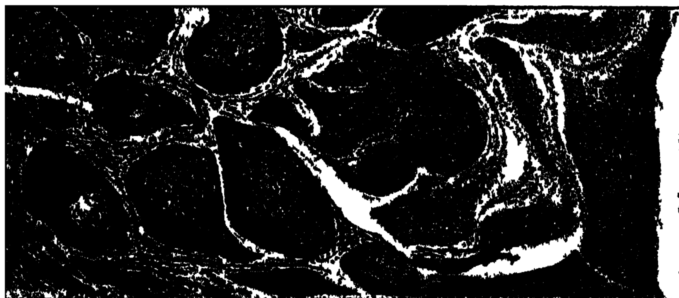


FIG 124—SECTION OF GROWTH SHOWN IN FIGS 122 AND 123 SQUAMOUS CELLED CARCINOMA (Case 12 *)
The patient was free from recurrence and well for nearly twelve years after the removal of the cervix She died about a year later of some disease of the liver, the exact nature of which was not known, but it was ascertained that there was no local recurrence of the disease at the time of her death

PATHOLOGY.

As carcinoma always originates from pre-existing epithelium, we may have it as regards the cervix, arising from the squamous epithelium of the vaginal portion, or from the

* The number refers to the Table of thirty three consecutive cases of supravaginal amputation of the cervix for cancer in the author's monograph "Cancer of the Uterus," p. 219

cubical epithelium within the cervical canal, either that on the surface, or in the deeper parts of the cervical glands.

Clinical types.

The "cauliflower" excrescence.—This originates from the squamous epithelium of the vaginal portion. It may be found as—

(1) A sessile patch ;

(2) A larger lobulated or semi-polypoid growth.



FIG. 125.—The same section under a high power Squamous-celled carcinoma. It corresponds to the left-hand corner of preceding figure. (Case 12.*)

(1) *The sessile patch.*—When the disease is in an early stage there may be a small patch—for instance, the size of a shilling—on one or other lip of the cervix, generally close to the external os, or partly within it. The patch may be sessile, and raised above the level of the surrounding healthy tissue to the extent of a sixteenth of an inch. Its surface

* The number refers to the Table of thirty-three consecutive cases of supra-vaginal amputation of the cervix for cancer in the author's monograph "Cancer of the Uterus," p. 219

is faintly papillary, and in colour dull red, or reddish yellow. It bleeds very easily when touched, and in consistence it is friable. The point of the uterine sound (which is of course



FIG. 126. Cauliflower excrescence, lobulated form. (Case 17 *)



FIG. 127. Lobulated or semi-polypoid form. Side view of the whole cervix removed by supra-vaginal amputation. A glass rod has been passed through the cervical canal. (Case 16 *)

blunt) when pressed on such a patch can easily be made to penetrate its substance. Such a patch feels soft to the finger

* The number refers to the Table of thirty-three consecutive cases of supra-vaginal amputation of the cervix for cancer in the author's monograph "Cancer of the Uterus," p. 219.

(2) *Larger lobulated or semi-polypoid form.*—In other cases the growth may be more papillary, or even distinctly lobulated, so that springing from one lip of the cervix we may have a reddish yellow lobulated growth, one or more of the lobules having a somewhat narrow attachment, thus presenting a semi-polypoid character. Still having in view comparatively early cases, such a mass as that described may

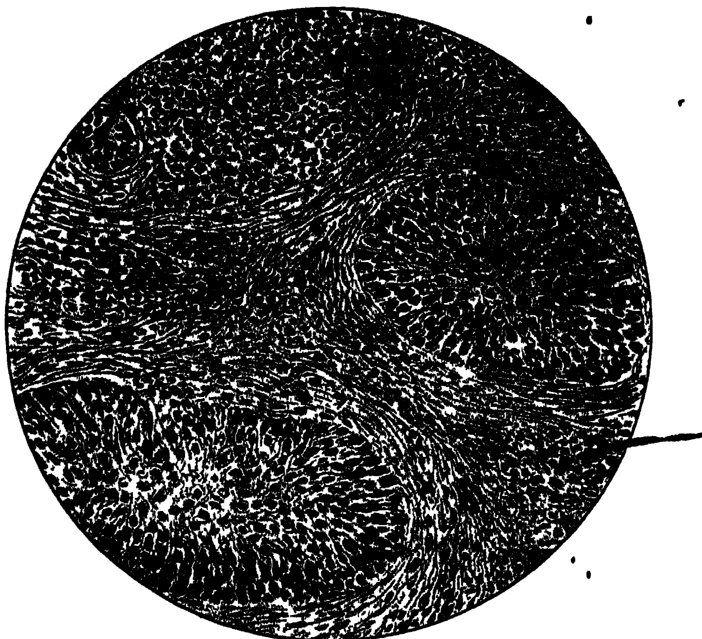


FIG. 128.—SQUAMOUS-CELLED CARCINOMA. (Case 16.*)

project from the lip of the cervix involved to the extent of an inch or more. In more advanced cases there may be a mass the size of the fist springing from the cervix by a comparatively narrow attachment. The attachment may be so narrow relatively to the size of the "cauliflower" mass as to suggest to the inexperienced observer that he has a case of fibroid polypus to deal with. The pedicle of these

* The number refers to the Table of thirty-three consecutive cases of supra-vaginal amputation of the cervix for cancer in the author's monograph "Cancer of the Uterus," p. 219.

malignant "cauliflower" masses is, however, never so distinct as in cases of non-malignant polypus. It may seem fairly distinct at some part of its circumference, but on attempting to trace the pedicle all the way round, it will always be



FIG. 129 — Represents a uterus removed by vaginal hysterectomy for cancer of the cervix, and laid open There is a very extensive papillary growth occupying the whole of the cervical canal Nothing of it projected at the external os before the uterus was laid open On physical examination the external os was a little patulous, and the finger pressed firmly up could just feel a little of the papillary growth Vaginal hysterectomy, recurrence within two years. (Case 6 *)

found that it ceases to be distinct at some part of its circumference, and shades off imperceptibly into the substance of the cervix. In cases of non-malignant polypus the pedicle can be distinctly traced throughout its circumference.

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p 224.

The surface of such a large "cauliflower" mass as we are considering is in outline often somewhat similar to that of the white part of a cauliflower When seen through a speculum it is found to be chiefly of a deep red colour, with a yellowish-white tint here and there In places, distinct sloughs may often be seen on its surface Such a mass bleeds very readily and profusely on touching it and is so friable that even gentle examination is often enough to break off small portions of the growth, which then, after the escape of the blood contained in them, are seen to be

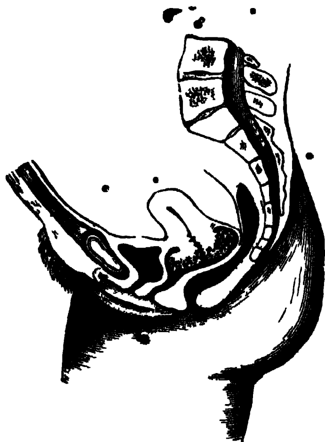


FIG 130—CARCINOMA OF THE CERVIX (Schroeder) Mushroom shaped variety The disease affects both lips of the cervix, so as to cause the vaginal portion to have a rough resemblance to an inverted mushroom

yellowish white Generally, however, the attachment of these large "cauliflower" masses is broad rather than narrow

Mushroom-shaped form — This is merely a variety of the "cauliflower" excrescence, in which both lips of the cervix are the seat of the growth On examination a mass is found having the colour and other characters described, with a surface convex downwards springing from the whole cervix. The margin of the mass is found to distinctly overhang the uninvolved mucous membrane of the adjacent vaginal fornices. The os uteri may not be easy to find, but it lies somewhere about the centre of the convex mass The whole

cervix on longitudinal section will be found to have roughly the outline of an inverted mushroom, the cervix representing the stalk, and the growth the other part of the mushroom.

Punctiform exudation of puriform fluid.—In some cases of "cauliflower" growth best marked in my experience in some of those of the inverted mushroom type, the surface of the mass is not readily friable. The sound does not enter the



FIG. 131.—UTERUS REMOVED BY VAGINAL HYSTERECTOMY IN CASE 15*
(SQUAMOUS CARCINOMA OF VAGINAL PORTION OF CERVIX)

A, A. Point to parts of the vaginal portion, to the naked eye apparently healthy. There was a ring of similar vaginal portion all the way round, external to the growth. B. The extensive cauliflower growth. C. Peritoneum on anterior surface of body of uterus. The patient remained free from recurrence till she died of phthisis six years after the operation.

substance of the growth on reasonable pressure; but though it does not do so in the case in question, the pressure on the surface of the growth causes the exudation of small yellowish-white drops from various points of the surface. This seems

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

to be due to the surface epithelium retaining its general coherence, but having weak places, or apertures, scattered

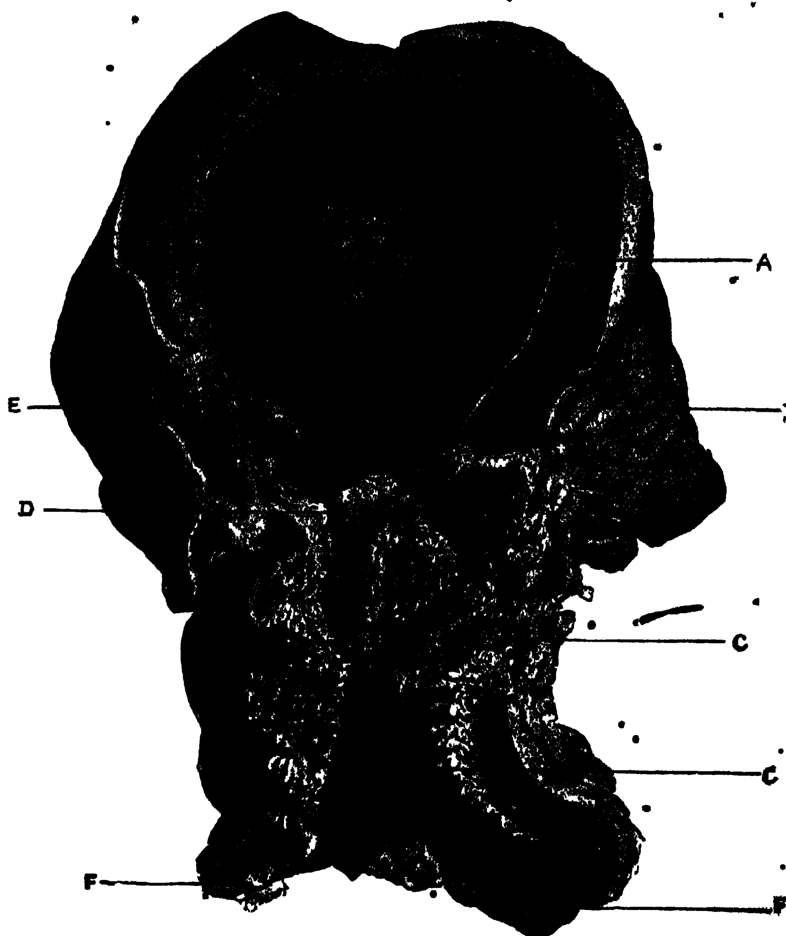


FIG 132—UTERUS REMOVED BY VAGINAL HYSTERECTOMY, AND LAID OPEN. (Case 23 * Table IV)

A. Cavity of body of uterus enormously dilated It contained fœtid pus, which escaped during the operation B. Cut surface of wall of body of uterus. C Growth in cervix ("squamous-celled epithelioma"). D Internal os. E. Peritoneal surface of uterus. F. External os Patient well more than seven years after the operation

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

over the surface which allow the soft underlying growth, or its juices, to exude on firm pressure. Whatever the explanation may be, it is an important clinical sign, because the surface of the growth is not friable in the usual way, and this might lead to mistakes as to the real character of the condition present. The growth immediately under the surface is just as friable as in the other cases already described. The same sign is found at times in cases where there is no projecting growth, but a more or less diffuse malignant

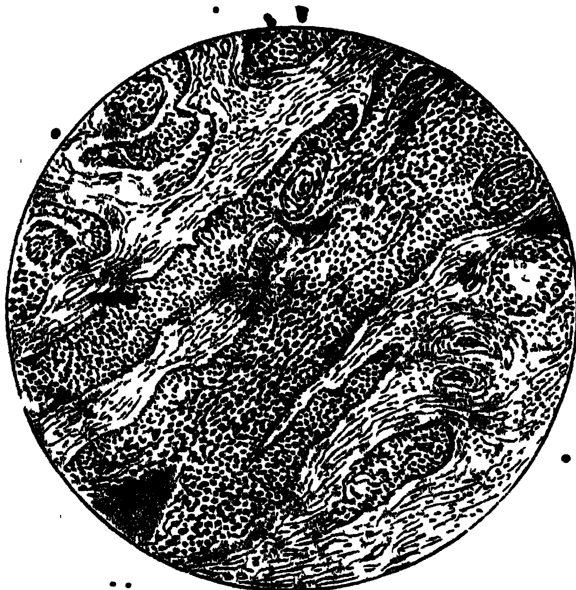


FIG. 133.—Shows a section of the growth from Case 23* under a low power. Solid branching columns of squamous celled epithelioma are shown infiltrating the substance of the cervix uteri. Large cell nests are present, as well as areas of granular degeneration in the centres of the epithelial processes. (Mr. Targett's description for the Clinical Research Association.)

infiltration of the vaginal portion of the cervix. I have been familiar with this sign, and have demonstrated it to students for many years, and described it elsewhere † in 1902. I had not seen any reference to this sign elsewhere, though it is

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

† "Cancer of the Uterus," H. K. Lewis, 1902.

probable that others may have noticed it. In my experience it is pathognomonic of a malignant growth.

To recapitulate.—The "cauliflower" excrescence may therefore occur—

(1) As a small raised patch;

(2) As a lobulated, or semi-polypoid, mass of moderate size; for instance, the whole not larger than a walnut;



FIG 134 —The same section (Case 23 *) under a high power. The squamous character of the epithelial cells is here represented, and in the centre keratoid and other degenerative changes have taken place The cells have separated from the stroma by shrinkage (Mr Targett's description for the Clinical Research Association)

(3) As a semi-polypoid mass the size of the fist, or larger;

(4) As a mass like an inverted mushroom.

The colour is for the most part a dark red, with a yellowish-white tint in places. The growth bleeds readily

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

and freely on touching it The discharge may, or may not be offensive The growth is very friable.

In certain cases, which seem to be an exception as regards



Fig. 135—Uterus removed by vaginal hysterectomy for cancer of the cervix The appearance of the cervix is shown in Figs 136 and 137 The cancerous growth is not well seen from this aspect The uterus has been split almost completely in two from before back There are several fibroids in the body of the uterus a small one at the top of the figure to the reader's left, is a sub-peritoneal fibroid The largest represented is interstitial, and there is also a submucous fibroid Carcinoma of the cervix very rarely co-exists with fibroids The patient was known to be free from recurrence six years after the operation

friability, pressure on the surface of the growth causes *punctiform exudation* of puriform fluid

In the majority of cases cancer of the cervix occurs in the form of one of the varieties of the "cauliflower" excrescence

2. *The hard, slightly raised plaque.*—Occasionally carcinoma of the cervix appears as a sessile slightly raised patch, with a fairly regular surface; the surface is not papillary. Such a patch feels hard. In spite of this, however, the sound can be made to penetrate its substance. It is quite different to the touch from the "cauliflower" excrescence.

3. *The nodular variety.*—In this variety a nodule of malignant growth appears in some part of the ring of cervical tissue immediately bounding the os uteri. Fig. 138 shows the appearance presented when the uterus was laid open after vaginal hysterectomy. Before operation a nodule was seen in the posterior lip of the cervix about the size of a cobnut.



FIG. 136.—The hard, slightly raised plaque, front view. The surface is not papillary.



FIG. 137.—The hard, raised plaque, side view (after removing the uterus).

(Both from the same case as the preceding figure.) The patient was known to be well five years after the operation.

On cutting open the cervix the growth was found, as represented in Fig. 138, to extend up to, and indeed a little above, the internal os. In another case (Fig. 139) the nodule was spherical, and about the size of the human eye. It had developed from the tissue of the vaginal portion just within the os uteri.

Such malignant nodules are red, with a yellowish tint, and are extremely friable. They bleed readily on examination, and a sound easily penetrates the substance of the nodule. In cases of this kind the malignant growth causes a considerable thickening of the affected lip of the cervix. This is well seen when examining with a Sims' speculum,

and also after removal of the uterus, on making an antero-posterior section of the cervix (Fig. 140)

It may be said here that Fergusson's speculum is not

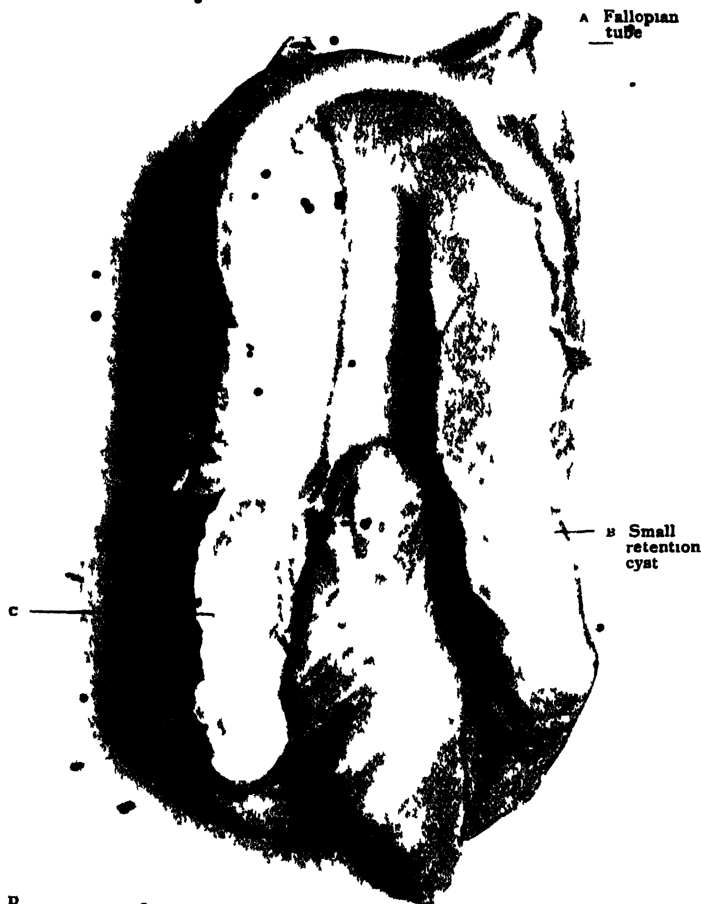


FIG 138—NODULAR FORM UTERUS REMOVED BY VAGINAL HYSTERECTOMY, AND LAID OPEN

C. Shows on the cut wall of the cervix the margin of the malignant infiltration, which is very extensive

D The pointed extremity of the malignant nodule, which, before the cervix was removed and laid open, gave one the impression that the growth was of limited extent After opening the cervix, D is seen to be merely the lower end of an elongated malignant growth extending to the internal os, and indeed a little above it Recurrence in fourth year after the operation



FIG. 139.—NODULAR FORM, FRONT VIEW, AS SEEN THROUGH THE SPECULUM.



FIG. 140.—ANTERO-POSTERIOR MESIAL SECTION OF UTERUS REMOVED BY VAGINAL HYSTERECTOMY FOR CARCINOMA OF THE CERVIX.

The posterior lip and wall of the cervix are occupied by a large malignant nodule (glandular carcinoma). The thickening of the affected lip is well seen. This lip is four or five times as thick as the unaffected lip.

well suited for cases of cancer of the cervix, especially for cases of cancer of the vaginal portion. In all but the earliest cases it cannot be passed without coming in contact with the growth, which will then bleed freely, and prevent any useful view being obtained. On the other hand, after first ascertaining the general relations of the growth with the finger, it is generally possible to pass a Sims' speculum without

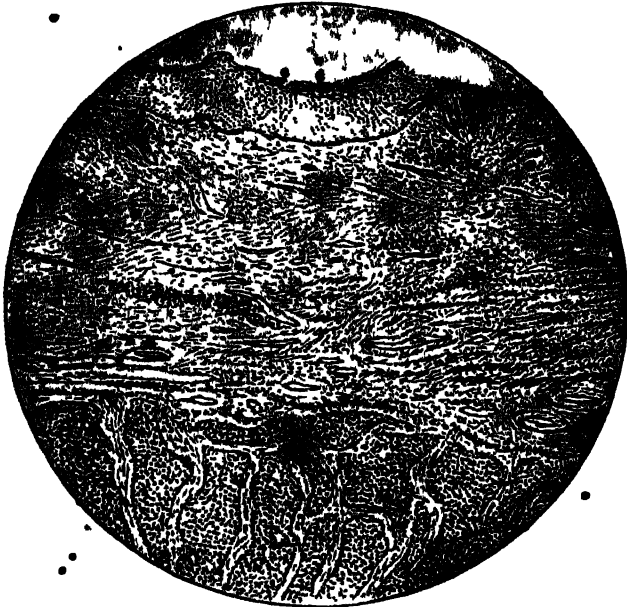


FIG 141 —Represents a section from the edge of the growth in Case 26* under a low power At the top is a portion of vaginal mucous membrane, and beneath this comes a broad strand of submucous tissue and bundles of unstriped muscle. The vessels are distended, and many foci of small round inflammatory cells are seen in this layer At the bottom of the field are depicted the solid elongated processes of the squamous-celled epithelioma (Mr Targett's description for the Clinical Research Association) Vaginal hysterectomy Patient well nearly six years afterwards

touching the growth to any marked extent There is therefore less chance of bleeding, and a good view of the growth can generally be obtained.

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p 224.

The crater-like or conical ulcer.—In early cases.—In these a more or less extensive ulcer is found in the situation of the external os uteri, and extending a variable distance up the cervical canal. The cavity is roughly cone-shaped, the wider part is below, and in early cases is still bounded by a ring of cervical tissue. At such a time on examination a cavity of the shape described is found in the situation of the

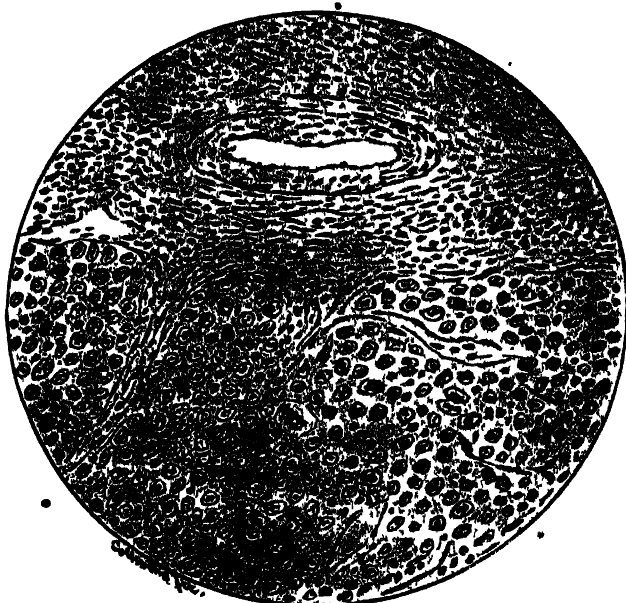


FIG. 142.—Represents a portion of the growth from Case 26 * under a higher power. The cells are large, but their outlines are very indistinct, so that merely their large round or oval nuclei with nucleoli are recognisable. No cell-nests are present, but a few larger cells may be seen which exhibit the so-called "cell-inclusions"; one of these is represented in the drawing. The stroma consists of a few strands of cellular tissue in which the vessels run (Mr. Targett's description for the Clinical Research Association).

external os and lower part of the cervical canal that will admit the finger for perhaps half an inch, or more. The walls of the cavity are formed of hard tissue, having an irregular surface. When the surface of the ulcer can be seen,

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

it is found to be of a grey, or blackish-grey colour, with here and there yellow patches At the lower edge of the ulcer a narrow, hard linear ridge of a red colour is often seen immediately outside the ulcer on the surface of the vaginal portion This ridge is only slightly raised above the general surface

In more advanced cases—If a transverse segment of cervical tissue at the level of the external os be considered, the growth spreads from the centre towards the circumference,



FIG. 143—DRAWING OF A SECTION OF THE GROWTH IN CASE 18 *

"The growth is a columnar celled carcinoma, and the drawing represents a series of irregular tubules cut in various directions which permeate the soft nucleated cellular stroma The tubules are lined with columnar epithelium, and some of them form small cysts filled with processes and foldings of their epithelial lining (Mr Targett's description) Supra vaginal amputation of the cervix Recurrence a year after the operation

the older central portion of growth melts away, and produces a cavity, and successive rings of growth, each larger and larger, die and similarly disappear Thus the cavity in the centre of the segment under consideration grows larger and

* The number refers to the Table of thirty three consecutive cases of supra-vaginal amputation of the cervix for cancer in the author's monograph "Cancer of the Uterus,' p 219

larger. The same process is in operation at each transverse section of the cervix affected by the growth.

As the process continues, the malignant growth spreading at the periphery, and breaking down in the centre, a time comes when all the lower part of the cervix and the vaginal portion is completely destroyed.

In examining an advanced case of this kind we find a hard ring of tissue at the upper part of the vagina. This ring of tissue may seem to be a quarter of an inch thick, or more. This ring is apt to be mistaken by the inexperienced for cervical tissue. It really, however, consists of the vaginal wall and the connective tissue subjacent to it, which have



FIG. 144 —Crater-like ulcer, early stage, front view. The microscopical structure is shown in Fig 118.



FIG. 145 —Crater-like ulcer, early stage, side view The same specimen as represented in Fig 144 after removal of the whole cervix by supra-vaginal amputation. The patient was known to be well twenty years after the operation.

both, especially the connective tissue, become infiltrated by the advancing malignant growth

Within the circle of the hard ring there is an opening which is found to lead into a large cavity often of much greater diameter than the opening leading to it. In such a case the ulcer would, of course, on section from above down be irregularly ovoid rather than conical In such a case the disease probably began in the cervical canal, and the greatest loss of substance by extension of the growth and ulceration has taken place in that situation. Whether the cavity be ovoid, or conical with its largest portion below, its

walls are formed chiefly by the connective tissue normally surrounding the supra-vaginal cervix, which has become infiltrated by the malignant growth—little or none of the cervical tissue remaining. At this stage one or more somewhat papillary projecting masses of growth (small "cauliflower" growths) may be seen springing from the margins of the opening leading into the malignant chasm. By this time



FIG. 146 – Section of the growth removed in Case 37 * Squamous-celled carcinoma and adenoma of the cervix in the same section † Vaginal hysterectomy Recurrence within a year

the growth will have spread also downwards, forming either a growth springing from the surface of the vaginal walls; or, more frequently, the epithelial surface of the vagina may appear normal, but the malignant infiltration has spread downwards in the submucous connective tissue The corre-

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

† See Mr Targett's full report on this specimen in the author's monograph "Cancer of the Uterus," p. 196.

sponding portion of the vagina thus feels hard, rigid, and inelastic.

Carcinoma of the supra-vaginal cervix.—The physical signs in cancer of the supra-vaginal cervix are in early cases much less obvious than when the disease begins on the vaginal portion Consequently there is much more chance of overlooking an early case when the disease begins in the supra-vaginal cervix. Also, in such cases, on examination the vaginal portion may appear normal or nearly so. Generally, however, some slight change is to be found at or near the external os on careful examination. The shape of the os may be peculiarly irregular—that is, irregular in



FIG. 147.—Shows the vaginal portion of the uterus represented in Fig 148 as it appeared on examination with the speculum The os is occupied by a small portion of the malignant growth. This appearance, taken alone, would rather suggest that the disease was in an early stage—an impression corrected by looking at Fig. 148

a way not to be explained by the ordinary lacerations which occur in labour. In such a case, if the lips of the cervix be everted by a volsella on each lip, something of the growth, or some evidence of ulceration may be seen within the cervical canal.

In cases of this kind especially, the malignant growth tends to spread outwards through the walls of the supra-vaginal cervix, and to infiltrate the connective tissue round it. Thus is produced the "thickening" found in such cases on one or both sides of the cervix.

Clinically, cancer of the vaginal portion cannot always be distinguished from cancer of the supra-vaginal cervix.

Thus, for instance, on examination a small growth may be seen at the os uteri having typical malignant characters, and, so far, the case might be supposed to be one of early cancer



FIG. 148 —Represents the uterus (of which the vaginal portion is shown in Fig 147) removed by vaginal hysterectomy, and laid open The growth is seen to involve the whole cervical canal, and about half of the endometrium as well

of the vaginal portion. But in many such cases, when the uterus has been removed and laid open, it will be found that there is an extensive malignant growth occupying the cervical

canal as far as the internal os, and in some cases it has also extended into the body of the uterus. Such cases are probably examples of cancer beginning in the supra-vaginal cervix.

DIRECTIONS IN WHICH CARCINOMA OF THE CERVIX TENDS TO SPREAD.

It may spread—

(1) *Downwards* on to the vaginal walls;

(2) *Outwards* into the connective tissue round the cervix, into the broad ligaments and utero-sacral ligaments;

(3) *Upwards* along the cervical canal into the body of the uterus (see Fig 148).

There is usually a greater tendency for the growth to spread to the vagina, and to the peri-cervical connective tissue, than to the body of the uterus Still there are some cases in which the growth does extend upwards to the body of the uterus before it has spread to the vaginal walls, or the peri-cervical connective tissue In advanced cases the ureters become dilated from obstruction, partly due to pressure, and partly to the walls of the ureters themselves being infiltrated; ultimately hydronephrosis may be produced

As the growth that has involved the anterior vaginal wall ulcerates, we may have a vesico-vaginal fistula; more rarely, from similar processes involving the posterior wall, recto-vaginal fistula.

In advanced cases, where ulceration has been a prominent feature, the bladder and rectum may communicate freely with the vagina (Fig. 149).

Symptoms.—The special local symptoms of carcinoma of the cervix are:—

1. *Bleeding;*
2. *A discharge*, which sooner or later becomes offensive;
3. *Pain.*

Other local symptoms occasionally present are:—*painful, difficult, or frequent micturition, and pruritus of the vulva.*

It should be noted that cachexia is only present in cases that are far advanced. The patient may look quite well for a considerable time in cases of cancer of the cervix. Nothing can be more misleading than to conclude that a patient

cannot have cancer of the cervix because, as regards the face, she looks well.

Bleeding.—In most cases hæmorrhage, occurring at some time other than a menstrual period, is the earliest symptom to attract attention. It is impossible to over-estimate the importance of never regarding this symptom as a thing of little significance, to be treated lightly by an ergot mixture and an astringent douche without thorough examination. Occasionally a persistent white or yellow discharge, increasing in quantity, and ultimately becoming offensive, may be the symptom that first attracts attention, there being no unusual

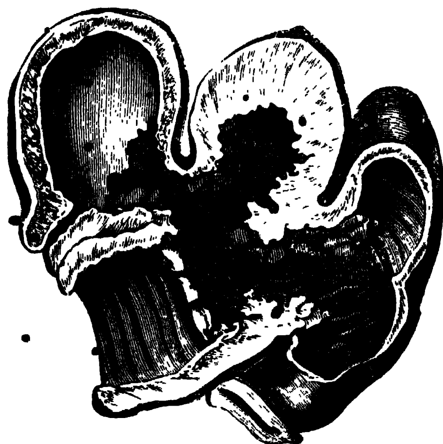


FIG. 149.—CARCINOMA OF THE CERVIX.

An advanced case where ulceration has been a prominent feature. The bladder and rectum communicate freely with the vagina (Farre).

bleeding till the disease has reached a somewhat advanced stage. This is, however, quite the exception.

Hæmorrhage after coitus is particularly significant of carcinoma of the cervix.

It may be taken as a general rule that hæmorrhage coming on some years after the menopause is almost always due to malignant disease.

The discharge.—In early cases, before ulceration has taken place, the discharge is not offensive; at this time it is likely to be yellowish, and more or less streaked with

blood. Later, when ulceration has set in, the discharge does become horribly offensive, and at this time it is usually thin, and like dirty water It should be especially noted that an offensive discharge is not pathognomonic of carcinoma. A sloughing fibroid polypus, for instance, produces a discharge every bit as offensive as any that occurs in cases of carcinoma; and on the other hand, as mentioned above, in early cases of carcinoma, the discharge is not offensive.

Pain.—This is a late symptom in carcinoma of the cervix; when at length it appears, it is extremely severe, and usually worse at night, so that the patient cannot sleep without morphine

Fever.—When ulceration has occurred, and the discharge has become offensive, there is fever, due to absorption of the chemical products of putrefaction—septic intoxication, or sapræmia. The result of scraping away the diseased tissue as completely as possible shows this; for whereas before the scraping the temperature chart has shown the presence of moderate fever, after the scraping the temperature falls, and often remains normal till fresh portions of the growth necrose, and putrefy.

In advanced cases a condition of one or both lower extremities, indistinguishable from the phlegmasia dolens of puerperal women, is not uncommon

Physical signs.—On vaginal examination with the finger and speculum, we may meet with any of the varieties already sufficiently described, viz :—

1. *The "cauliflower" excrescence*, in one or other of its various forms,
2. *The hard, slightly raised plaque*,
3. *The nodular variety*;
4. *The conical ulcer.*

Even gentle examination with the finger almost always causes rather free bleeding. Fergusson's speculum should, as a rule, only be used in early cases; if it is desirable to pass a speculum in advanced cases, Sims' speculum is the best for the purpose, care being taken to avoid touching the diseased tissue as far as possible.

In cases where the disease has commenced a little distance above the os uteri, it may be necessary to evert the lips of the

cervix with tenacula, in order to see any evidence (*e.g.*, ulceration) of the disease.

In such cases, when the finger is pressed firmly against the suspected area, the tissue will usually be found to break down, if affected by a malignant growth.

Mobility of the uterus.—In early cases the uterus is freely movable. Later, as the growth spreads to the vagina and connective tissue round the cervix, it becomes less and less movable; finally, in advanced cases, when the infiltration has advanced along the broad ligaments and utero-sacral ligaments, to the pelvic wall, the uterus becomes completely fixed.

When the disease has reached this stage, on abdominal palpation we can generally feel a hard mass in the hypogastric region occupying the brim of the pelvis.

Diagnosis.—In most cases the diagnosis is easily made, because most cases come under observation at a comparatively advanced stage, when the physical signs are characteristic. In early cases carcinoma of the cervix has to be distinguished from the following:—

Non-malignant erosions of the cervix, especially those that bleed easily when touched;

Warty growths on the cervix;

Fibroids: fibroid polypus, submucous and interstitial fibroids of the cervix;

Mucous polypi and mucous tumours of the cervix;

Syphilitic affections of the cervix;

Tubercular disease of the cervix;

Laceration of the cervix, with eversion of the cervical mucous membrane;

Hypertrophy of the vaginal cervix;

Cysts of the cervix;

Ulceration of the cervix;

Pelvic peritonitis.

1. *Non-malignant erosions.*—The tissue of an erosion does not break down when pressed upon by a blunt instrument such as the sound; nor will pressure with the sound on the surface of the erosion cause the punctiform exudation of puriform fluid.

A minor point of difference between erosions and

malignant growths of the cervix is as regards the position of the suspected area An erosion generally tends to be bilaterally symmetrical as regards the middle antero-posterior line. Thus, if there is an erosion on the anterior lip, there is generally as much of it to the left of the middle line as to the right. This symmetry, on the other hand, is generally the exception rather than the rule in cases of malignant growth on one or other lip of the cervix, though it may occur. Again, the bleeding that occurs on examination is never anything like so free in cases of erosion as in cases of cervical cancer.

2. *Warty growths on the cervix.*—An isolated warty or papillomatous growth on the cervix is almost certainly of a malignant nature. In some cases, however, where there are warts on the external genitals, and more or less generally over the whole vagina, warts on the cervix are present also. In such cases the warty patches on the cervix may be confidently considered to be non-malignant. I have seen many such cases.

3. *Fibroids: fibroid polypus.*—A sloughing fibroid polypus is the kind of fibroid most likely to cause difficulty in diagnosis. Some of its symptoms, hæmorrhage and offensive discharge especially, are also symptoms of cancer of the cervix.

A large "cauliflower" growth, filling the upper part of the vagina, and perhaps appearing to spring from the cervix by a sort of pedicle, has a good deal of resemblance to some sloughing fibroid polypi.

Points of distinction are:—The general outline of a sloughing fibroid polypus is much more regular than that of the "cauliflower" mass. The colour of the sloughing fibroid is greyish, whereas that of a "cauliflower" mass, though it may be grey or yellow in places, is generally to a large extent of a deep red colour. Again, the pedicle of the fibroid polypus is quite distinct and definite all the way round its circumference, while the attachment of the malignant mass is never so. At one part it may appear definite, but at other parts its attachment is indefinite, and shades off gradually into the general substance of the cervix. I have known a polypoid malignant growth of the cervix mistaken for a sloughing fibroid polypus.

Submucous and interstitial fibroids of the cervix.—All fibroids of the cervix are much rarer than fibroids of the body of the uterus.

As regards a submucous fibroid of the cervix—*i.e.* one where the greater part of the fibroid projects into the cervical canal and towards the external os uteri—it is just possible that the growth might be mistaken for cancer. As a rule, however, with a submucous fibroid of the cervix (provided it is entirely cervical in origin and does not spring in part from the body of the uterus) there will be no menorrhagia or metrorrhagia. As regards consistence, such a growth is not friable, but firm and tough, nor does examination cause bleeding.

As regards interstitial fibroids of the cervix, they are not likely to attract attention till they have reached a fairly large size. The physical signs are rather peculiar, and may mislead any one who has not seen similar cases before. Thus I have known a large interstitial fibroid of the supra-vaginal cervix diagnosed as advanced cancer for which nothing could be done. What is found is as follows:—The external os is widely patulous, and, supposing for the sake of argument that the interstitial fibroid is in the posterior wall of the cervix, the anterior lip is much thinned, and is crescentic, with the concavity of the crescent directed backwards. The posterior lip of the cervix as such appears to be absent. This is due to the cervical tissue of the posterior lip being uniformly spread out over the convex surface of the underlying interstitial fibroid. In such a case the uterus is fixed, and in that respect the condition resembles what is found in advanced cancer The interstitial cervical fibroid is not friable (unless it is sloughing), and probably attention is called to it by pressure symptoms—especially connected with micturition, constant desire to pass water, and partial incontinence particularly.

When such an interstitial cervical fibroid sloughs, as it may do in rare cases, an opening through the lip of the cervix involved may be formed, and the sloughing mass then protrudes through the opening into the vagina. Such a condition does resemble cancer of the cervix rather closely. I have seen a case of this kind, and recorded it elsewhere.*

* *Lancet*. 1900, vol i., p. 444.

4. *Mucous polypi and mucous tumours of the cervix.*—Mucous polypi are small: an average size for them is that of a raisin. They are bright red, and distinctly pedunculated. Often two or three are present in the same case. They are generally attached just within the external os, but protrude from it into the vagina, so that they appear when a speculum is used, and they may also be felt with the finger. The diagnosis of a mucous polypus from a small cancerous



FIG. 150.—PRIMARY TUBERCULOSIS OF THE CERVIX.*

Uterus removed by vaginal hysterectomy. Papillary projections are seen at the external os, and extending up the cervical canal to the internal os Before the uterus was laid open, the external os was more patulous than normal.

growth attached to the vaginal portion, or just within the external os, is generally not at all difficult. In the case of a mucous polypus the attachment is narrow; it may bleed slightly on contact, but the bleeding is never so profuse as in the case of a cancerous growth. Similarly, mucous polypi often cause slight bleeding after coitus, but it is never so profuse as in cases of cancer

Mucous tumours of the cervix have been mentioned above. What I mean is that there are at times small

* For full report of the case, see *Trans. Obst. Soc. Lond.*, vol. xliv., p 144.

tumours the size of a pea or as large as a cobnut on the vaginal portion of the cervix which are not distinctly pedunculated, and cannot therefore properly be called mucous "*polypi*," but which, nevertheless, have the same structure as the ordinary mucous polypus. Such sessile tumours are much more likely to be mistaken for cancer than are mucous polypi themselves. Often such tumours are so small that, except by excising a piece of the cervix, it is almost im-



FIG 151 — PRIMARY TUBERCULOSIS OF THE CERVIX

Low power The figure represents a portion of the mucous membrane of the cervix uteri thrown into ridges and thickened by inflammatory growth In one of these ridges is embedded a group of grey tubercles with large well-formed giant-celled systems

possible to remove them for microscopical examination. A sufficiently good way is to touch a small growth of the kind with the sound heated in a spirit-lamp to red-heat If the little growth is non-malignant this treatment will be effectual, and after the separation of the small slough caused by the cautery the wound will heal soundly. Of course if the growth were malignant such treatment would be useless;

the growth would soon reappear, and the symptoms, especially bleeding on contact, return. I have known cases where these small sessile mucous tumours have caused great anxiety, and even some uncertainty for a time, on the part of experienced practitioners.

5. *Syphilitic affections of the cervix.*—Chancre on the cervix has been met with, but it is very rare. Other manifestations of syphilis would either be present, or soon

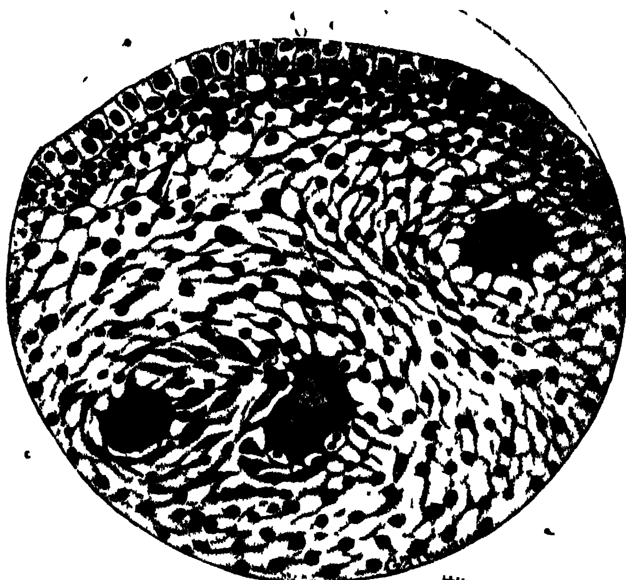


FIG 152 – Represents the top of the ridge shown in the preceding figure, with its columnar epithelium and cellular tissue Three large poly-nuclear giant-cells are represented (The description of this, and of the preceding figure, are by Mr. Targett, for the Clinical Research Association)

show themselves. Practically, difficulty in diagnosing cancer of the cervix is rarely caused by conditions of the cervix due to syphilis.

6. *Tubercular disease of the cervix.*—Primary tuberculosis of the cervix is very rare. I have met with two cases of it in my own practice. In the first the symptoms and signs so closely resembled those of cancer of the cervix that I made a diagnosis of cancer, and performed vaginal hysterec-

tomy. Subsequent examination of the tissues of the cervix showed that the condition was due to tubercle.

7. *Laceration of the cervix, with eversion of the cervical mucous membrane.*—The vaginal cervix appears much increased in diameter, and, owing to the laceration on one or both sides, or elsewhere, the cervical mucous membrane is everted, and thus presents an extensive red area on inspection; also, there is more or less discharge, but it is not generally blood-stained. Again, there is a hardness owing



FIG. 153.—TUBERCULOSIS OF VAGINAL PORTION OF THE CERVIX. (*Micro-photograph.*)

A granular vascular patch was excised from the cervix. The section taken from it shows two giant-celled systems lying in the stroma of the cervix, and considerable inflammatory round-celled exudation is seen at the periphery of the field.
Clinical note.—The patient, aged 57, was married, but had had no children or miscarriage. Bleeding for two weeks eight years after the menopause.

to the cicatricial tissue in the neighbourhood of the laceration; also, there is often a good deal of hypertrophy of one or both lips of the cervix. Still, there is no bleeding on examination, or only a mere trace of it. Further, if the cervix is exposed with a Sims' speculum, it is often possible with tenacula to pull the separated lips of the cervix together, and thus restore to some extent the original

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appearance of the vaginal portion. There is, besides, no friability of the tissues.

In such cases there are often little hard shotty nodules to be felt. These are little retention cysts, which form small pearl-coloured elevations. Occasionally such elevations are yellow in colour, owing to changes in the cyst-contents. They are called *ovula nabothi.* Curiously they were at one time mistaken for tubercle of the cervix.

If pricked with a needle, or sharp hook a drop of mucus escapes, and the hard prominence felt disappears.

8. *Ulceration of the cervix.*—In cases of procidentia uteri, where the cervix with more or less of the inverted vaginal walls comes outside the vulva, extensive ulceration may occur. The ulcers are chiefly on the inverted vaginal wall, though the lips of the cervix are generally also involved. These ulcers are due to friction of the exposed parts against the clothes. They are often of large size, and have a punched-out appearance.

These ulcers do not bleed at all freely on touching; they may cause a slightly blood-stained discharge, but not free hæmorrhage. Besides, the tissues involved are not friable.

Apart altogether from procidentia uteri, in some cases where the patient has worn a pessary too long, especially an ill-fitting pessary, it may have so pressed on the vaginal portion of the cervix as to cause ulceration There is, however, no friability of the tissues, and removal of the cause is followed by rapid healing of the ulcer.

To sum up as regards differential diagnosis.—In practice diagnosis is seldom difficult; in cases where we are in doubt the condition almost always turns out to be non-malignant. When in doubt, careful attention to the points given in detail above will generally enable the observer to arrive at a correct opinion. In a few cases it may be necessary to cut out a small piece of the suspected tissue, and examine it microscopically before an accurate diagnosis can be made.

Infection of lymphatic glands.—The lymphatics of the cervix run to the iliac glands, usually three in number on each side, which lie in the neighbourhood of the bifurcation of the common iliac artery. There is also a gland, sometimes but not always, present in the broad ligament about an inch

from the side of the cervix. The lymphatics of the body of the uterus run to the lumbar glands, which lie on the aorta about the level of the lower end of the kidney. It is said also that lymphatics from the upper angles of the uterus run along the round ligament to the inguinal glands.

In early cases of carcinoma of the cervix the lymphatic glands are usually not involved. Cullen suggests that this is probably due to the large size of the cells in carcinoma of the cervix. They are too large to enter the lymphatic vessels until the growth has spread outwards into the broad ligament. Then a large lymphatic channel is broken into, and the cells are able to pass outwards to the glands.

Duration of the disease.—The duration of life from the time the patient first seeks advice may be taken on an average as from a year to a year and a half. Some cases only live a few months, others may live as long as three or four years, but this is exceptional.

Causes of death.—These are :—

Peritonitis in 25 per cent. of cases (Winckel) ;

Uræmia „ 45 „ „ „

Exhaustion is a factor in bringing about a fatal result in all cases. It is due to loss of sleep, loss of appetite, and sapræmic fever. The constant discharge must also be a factor in causing exhaustion.

Rarely death may be immediately due to :—

Hæmorrhage ; or,

Embolism.

Treatment.—In early cases.

From the point of view of treatment we may divide cases of cancer of the cervix into "early" cases and "advanced" cases. "Early" cases are those in which careful physical examination, preferably under anæsthesia, fails to detect any extension of the disease beyond the anatomical limits of the uterus. In these a radical operation offers at least some chance of permanent cure, or at all events of a reasonably long interval between the operation and a return of the symptoms. Obviously, even within this class of "early" cases there are some where the disease has reached a more advanced stage than it has in others.

"Advanced" cases are those in which the disease is found

to have extended in some or all of the directions in which it naturally tends to spread beyond the limits of the uterus itself.

Here again there are degrees of advancement. The broad ligaments, the utero-sacral ligaments, and the vagina may be extensively invaded, and, in extreme cases, nearly the whole pelvic contents may be invaded by the growth, so as to fill the pelvis with a hard fixed mass.

In less advanced cases there may be merely some "thickening" in the direction of one or other broad ligament, or in the direction of one or other utero-sacral ligament, or some limited extension on to the vaginal wall. It is often useful when estimating the degree of extension of the disease to attempt to draw down the uterus with a volsella. The infiltrated tissues being rigid will tend to prevent the uterus being drawn down. Also careful examination per rectum enables us to recognise still more clearly the degree of extension to the broad ligaments and the utero-sacral ligaments.

According to the degree of extension of the disease the uterus will be found to be merely less movable than normal, or nearly, or absolutely fixed. Occasionally, especially in thin patients, in "advanced" cases the enlarged iliac lymphatic glands can be recognised.

It does not follow even when the uterus is freely movable that the case is an "early" one. The growth may have involved the connective tissue between the cervix and bladder, and the base of the bladder, and yet the uterus may have its normal range of mobility, the bladder moving with it.

These preliminary remarks have an important bearing on treatment. In the "early" cases as defined a radical operation is advisable. In nearly all the "advanced" cases as above defined operation is contra-indicated. I say in nearly all, because in a small number where there is a *very limited* extension of the disease beyond the uterus either to the broad or to the utero-sacral ligaments, or to the vagina, hysterectomy by Wertheim's method may enable the operator to remove the whole of the affected tissue.

Formerly the only operations available for operable cases of carcinoma of the cervix were the supra-vaginal amputation

of the cervix at the level of the internal os, vaginal hysterectomy, and abdominal pan-hysterectomy. In all these operations the position of the ureter on each side of the cervix, and within about half an inch of it, formed an insuperable obstacle to a wide removal of the tissues in this situation. The method of hysterectomy by the abdominal route as devised by Wertheim overcomes this difficulty by a preliminary dissection of the ureters. This operation is un-

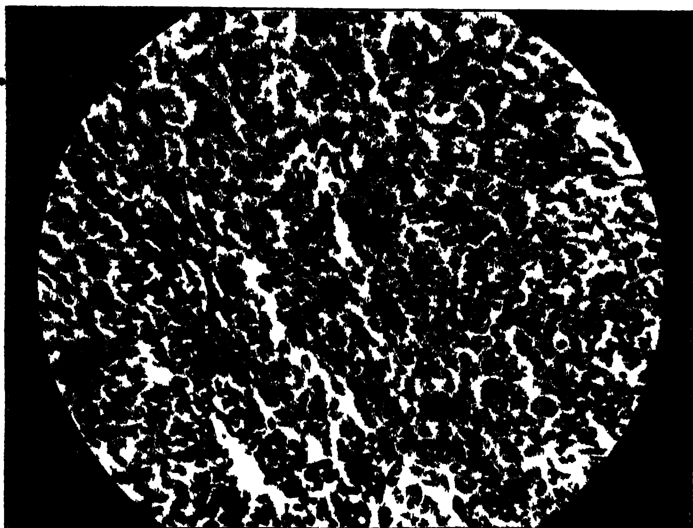


FIG. 154.—MALIGNANT ADENOMA OF THE CERVIX.
(*Micro-photograph.*)

Same case as that to which Figs. 155 and 156 correspond. The section is through the deeper layers of the primary growth *in situ*, taken from the specimen after operation. The section shows a solid polygonal celled carcinoma occupying the whole length of the cervical canal.

Clinical note. S. B., aged 42, married twenty years, five children, last two-and-a-half years previously, no miscarriages. Irregular hæmorrhage for two months. On examination a large soft nodular growth transversely ovoid seen on the posterior lip of the cervix. Growth curetted away, and cautery applied January 19, 1911. Wertheim's hysterectomy performed January 31, 1911; iliac glands removed on both sides. Did well after operation. Right iliac glands much enlarged, matted, and suppurating.

doubtedly the best in operable cases of carcinoma of the cervix. It is a formidable operation, and is unsuitable as a rule for patients of sixty and upwards, or generally for feeble patients at any age.

Wertheim's hysterectomy.

Preliminary step.—Where there is a growth that can be scraped away with the curette, which is not always the case, this should be done first; the whole of the surface which has been curetted is then freely cauterized with Paquelin's cautery. Wertheim himself does this without an anæsthetic immediately before starting the hysterectomy, so as to save as much time as possible during which the patient must be



FIG. 155.—MALIGNANT ADENOMA OF THE CERVIX. (*Micro-photograph.*)

Section through a mass of matted and suppurating right iliac glands removed at the end of a Wertheim's hysterectomy (same case as that to which Figs. 154 and 156 correspond). A large mass of cystic papillary carcinoma is seen. The iliac glands removed on the left side showed no secondary deposit.

under anæsthesia. I have found the preliminary curetting and cauterizing so painful without an anæsthetic, that I do this preliminary step some ten days or so before the hysterectomy, and under anæsthesia.

After the cauterizing the patient has antiseptic douches, and as a rule in ten days, or a fortnight, the sloughs have come away, and the parts have become clean.

The operation.—Immediately before the operation, a vaginal douche of 1-1000 perchloride is given. Then through a

Sims' speculum I place a piece of sterilized white gauze soaked in tincture of iodine against the diseased cervix, or into the cavity, if there is one. During this step india-rubber gloves are worn. After completing it they are removed, and the operator thoroughly washes and disinfects his hands again.

The patient is now anæsthetized, and the abdomen opened by the usual median incision. The patient is then raised



FIG. 156.—MALIGNANT ADENOMA OF THE CERVIX. WERTHEIM'S HYSTERECTOMY.

The section from tissue obtained at preliminary curetting shows cervical stroma almost entirely replaced by typical cervical glands with a single layer of high columnar epithelium lining them. There is nothing in the section except an increase of glandular tissue to warrant a diagnosis of malignancy, which was suggested by the history and physical signs, and proved by the secondary deposit in the iliac glands.

into the Trendelenberg position. An expanding retractor (Fig. 159) is placed in the lower angle of the wound. A careful examination is now made for evidence of any such marked extension of the discase as would contra-indicate proceeding with the operation. Involvement of the iliac glands is not a contra-indication necessarily, but only when the

growth has burst through the surface of the glands, and involved adjacent structures, for instance the walls of the iliac vessels. If the lumbar glands are involved the operation is contra-indicated.

Provided, however, no such contra-indications are present, the operation is proceeded with.

The round ligament is tied in two places, and divided, then the upper part of the broad ligament is tied and divided in such a way as to allow the uterine appendages to be

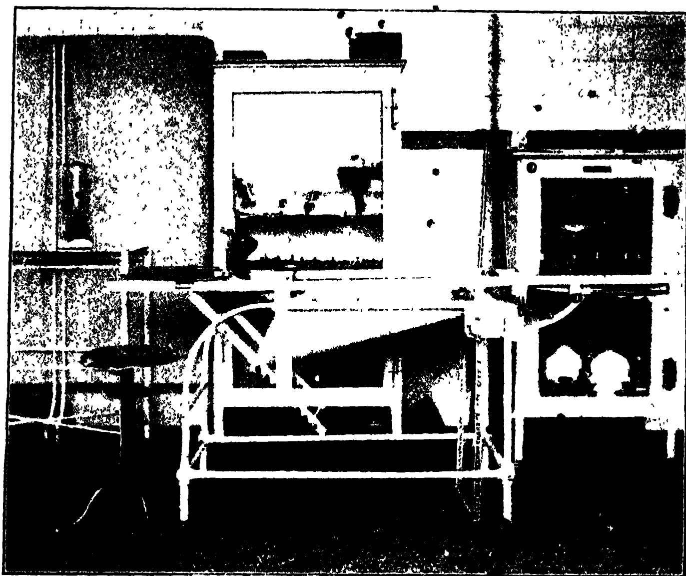


FIG. 157.—OPERATING-TABLE.

removed with the uterus. Reflux bleeding from the uterine side is controlled by ligatures, or clamps. When both sides have been dealt with, the operator proceeds to incise the peritoneum on the anterior aspect of the uterus, and strips it down, carefully separating the bladder from the anterior aspect of the cervix, and from the upper part of the vagina. This done, the uterus is carried forwards towards the pubes. The ureter is now sought for near the brim of the pelvis; it may be found by careful dissection in the subperitoneal tissue accessible to the finger by the opening up of the broad liga-

ment incidental to the ligature and division of the ovarian vessels. It must be clearly defined from the brim of the pelvis to the side of the cervix. Now the uterine artery can be felt for well outside the position of the ureter: a ligature on an aneurism-needle is passed beneath it, and securely tied. Another ligature may be tied a short distance from the first and the uterine artery divided between them. A pressure forceps is placed on the tissues at the side of the uterus to control reflux bleeding. The ureter, which has already been

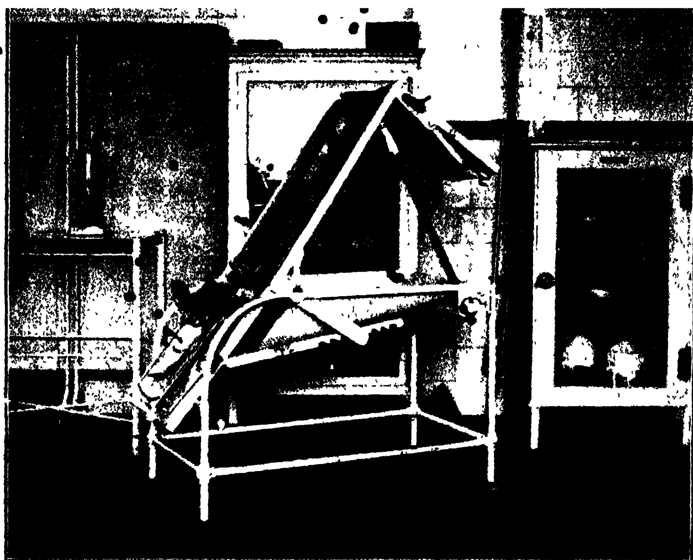


FIG. 158.—The same table as in Fig. 157, showing the arrangement for putting the patient in the Trendelenberg position. It is rarely necessary to use so high a position as that shown in the figure. Note the shoulder-pieces.

traced to the side of the cervix, is now dissected out, up to its point of entrance into the bladder. This is a step in the operation which requires the greatest care and patience, otherwise the ureter will certainly be injured. The ureter, while sufficiently free to permit of its being held out of the way as required, must not be stripped too clean, otherwise its vascular supply will be cut off, and it will slough. When the same thing has been done on the opposite side, the uterus is held upwards and forwards and the peritoneum of Douglas' pouch

is incised transversely, and stripped down so as to expose the posterior vaginal wall for a sufficient distance downwards. After doing this it will be found on pulling the uterus well up towards the edges of the wound that there are some strong bands of connective tissue, laterally and posteriorly, which are put on the stretch and prevent the uterus being drawn up very far. These bands are clamped by special clamps invented for the purpose, and divided. Half a dozen or more such clampings may be required. The portion of tissue in each

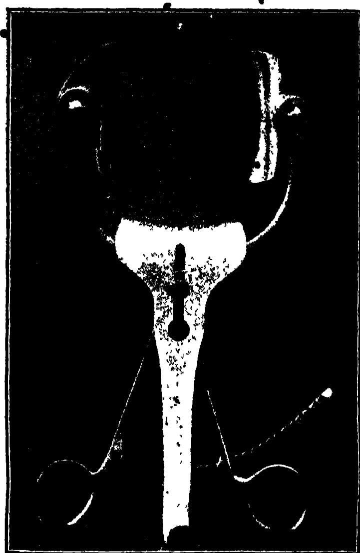


FIG. 159.—EXPANDING RETRACTOR, USEFUL IN WERTHEIM'S HYSTERECTOMY.

clamp is tied separately, and the clamp removed as the ligature is being tied.

The uterus now will be found to be attached only by the vagina. The knees are separated by assistants, and the operator, by means of a long sponge-forceps, pulls the gauze plug from the top of the vagina, and mops out the vagina with two or three pledgets of sterile gauze. This sponge-holder is put aside afterwards.

All that now remains is to hold the uterus well up towards the abdominal wound, and apply Wertheim's special



FIG. 160.—VARIOUS INSTRUMENTS USED IN WERTHEIM'S HYSTERECTOMY.

The dissecting forceps are of two kinds—serrated at the ends like the ordinary pattern, and toothed. All the instruments are made longer than those used in most other operations.

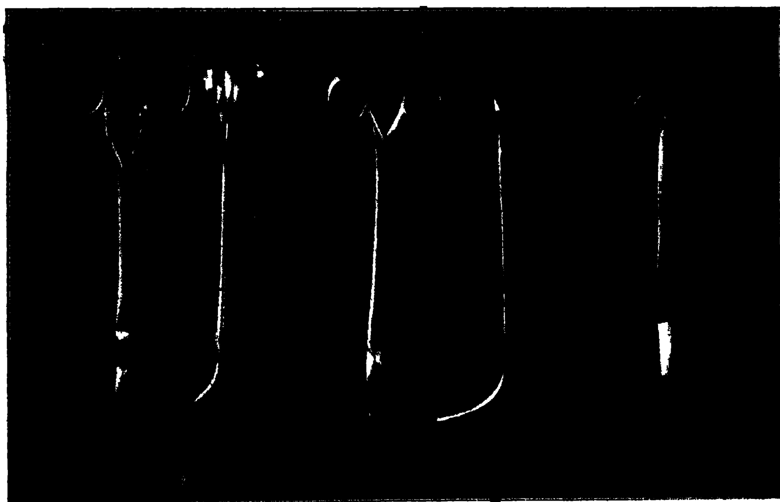


FIG. 161.—VARIOUS INSTRUMENTS USED IN WERTHEIM'S HYSTERECTOMY.

1, 1. Front and side view of forceps for clamping connective tissue bands deep in the pelvis. 2, 2. Front and side view of vaginal clamp. 3. Long blunt-pointed scissors.

vaginal clamps to the vagina at a suitable level, care being taken to avoid injury to the ureters, or the bladder. The vagina is then cut across below the clamps, and the uterus is removed.

Vessels in the vaginal walls always require ligatures, especially those near the outer part of the vagina on each side.

Infected glands are searched for, if not already discovered. If any enlarged glands are present, they are, if possible, removed.

When a careful inspection of the whole region has satisfied the operator that there is no bleeding of importance, a piece of sterilized gauze is pushed down the vagina with a long pair of forceps, which are then put aside. The gauze should only come level with the top of the cut vagina, and not project beyond it. Now the peritoneal flaps are carefully sutured together from side to side, so as to completely roof in the extensive raw surface left in the pelvis by the operation. The abdominal wound is then closed.

The orifice of the vagina is inspected to make sure there is no gauze hanging beyond it. If there is any, it is cut short, so that the end lies just within the vagina. The gauze is removed on the third or fourth day.

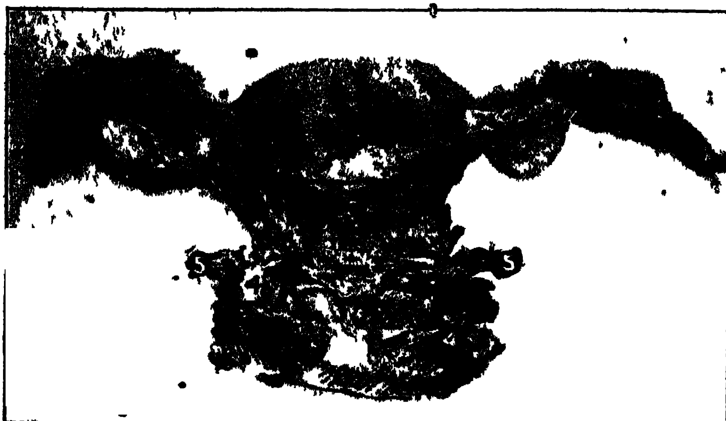
As the operation is necessarily long, and generally attended with more or less shock, in addition to the usual after-attention it will generally be advisable to let the patient have saline injections per rectum every two or three hours during the first twenty-four hours after the operation.

The distinguishing advantages of Wertheim's hysterectomy as compared with an ordinary abdominal pan-hysterectomy, are :—

1. By dissecting out the ureters and holding them aside, much more of the connective tissue at the sides of the cervix can be removed.

2. Infiltrated glands can, in many cases, be removed.

3 By clamping the vagina and cutting it across below the clamps, the region of the cancerous growth is isolated, so that there is less risk of septic infection, and also less risk of cancer cells becoming implanted on the various raw surfaces.



Anterior aspect of specimen 4, 4 Loose connective tissue, much more than can be removed without first dissecting out the ureters 5 5 Uterine arteries 6. Marks the vaginal wall. The serrated marks left by the clamps are well seen



Posterior aspect—uterus opened from behind Specimen removed by Wertheim's hysterectomy, July 4, 1907 1, 1 The large malignant ulcer occupying the cervical canal and extending slightly into the body of the uterus 2 Median ridge on anterior cervical wall which has escaped ulceration 3. The cavity of the body of the uterus

FIG 162 SQUAMOUS CARCINOMA OF THE CERVIX.

The patient was examined, and found to be well more than four years after the operation. For full notes of the case, see *Lancet*, 1908, vol. i, p 704.

For the majority of operable cases of cancer of the cervix no doubt hysterectomy by Wertheim's method is the best treatment. In those cases where the patient is over sixty years of age, or is a feeble subject, and unfit to undergo so severe an operation, and where the disease still seems to be limited to the uterus itself, vaginal hysterectomy is to be preferred.

Vaginal hysterectomy.

The patient is placed in the lithotomy position; the external genitals, previously shaved, are well cleaned with soap solution in alcohol, then with bin-iodide of mercury in

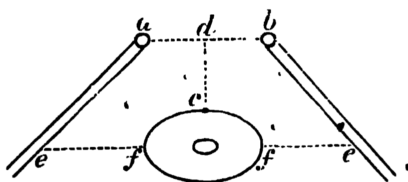


FIG. 163.—Diagram to illustrate relations of the ureters to the cervix when the patient is in the lithotomy position, with special reference to the operations of supra-vaginal amputation of the cervix, and extirpation of the uterus.

In seven specimens examined with reference to the distance *a b*, between the orifices of the ureters in the bladder, it was found that this varied from $\frac{9}{16}$ inch to 2 inches; average value of $ab = 1\frac{1}{11}$ inch.

In three specimens the distance *d c* was carefully measured, *i.e.* the distance from the cervix to a horizontal line joining the orifices of the ureters; in two specimens it measured $\frac{3}{4}$ inch, and in one specimen 1 inch.

In two specimens the distances *e f* were carefully determined, *i.e.* the distance from the side of the cervix to the ureter in a horizontal line passing through the middle of the cervix; in one specimen *e f* was $\frac{3}{4}$ and in the other rather more than $\frac{3}{4}$ inch.

On referring to the figure (p. 304) illustrating the incisions for the supra-vaginal amputation of the cervix and vaginal hysterectomy, it will be seen that there is ample room for them without any risk of injuring the ureters.

spirit, and then with perchloride of mercury solution 1-1000. The vagina is then well douched with the latter solution. Sims' speculum is passed, and a volsella is placed on the anterior lip of the cervix; it is often well to place another volsella on the posterior lip. The cervix is now drawn down to the vulva.

Fig. 165 shows diagrammatically the cervix, and the dotted line the incision made into the vagina round it.

As a rule the anterior incision *a b* is made first, and the connective tissue interval between the bladder and the cervix is sought for. The bladder can generally be separated as high as the vesico-uterine pouch with the finger; *c d* is the transverse incision made into the posterior vaginal wall. To make this the cervix is carried well forwards; after the vaginal wall has been cut through, it will soon be possible

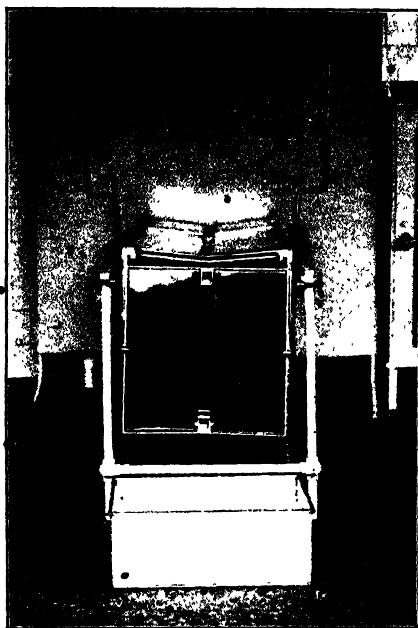


FIG. 164.—The same table as shown in Fig. 157 adapted for fixing the patient in the lithotomy position, as for vaginal hysterectomy.

to pinch up a piece of the peritoneum and incise it, so as to open Douglas' pouch. The ends of the anterior and posterior incisions in the vaginal wall are joined by incisions only going through the vaginal wall, *a* to *c* and *b* to *d*. A glance at Fig. 163 shows diagrammatically the relation of the ureters to the cervix. The bladder is held well up out of the way by a retractor; now the tissues at the side

of the cervix, in which the vessels lie, are defined with the finger and thumb, and a strong Wells' forceps is made to clamp them. The tissues are then cut through between the clamp and the cervix; now a ligature is passed by a rectangular needle in a handle so as to encircle the tissue in the forceps. When the ligature is in position, it is tied, the forceps being taken off by an assistant at the moment.

The same thing is done on the opposite side. Successive small portions of the lateral attachments of the cervix are similarly clamped, cut, and tied till the cervix is free on each side up to the level of the internal os. Now the vesico-uterine pouch of the peritoneum is opened. The uterus then is only attached by the broad ligaments on each side. A finger is passed up, and hooked over the top of the broad ligament

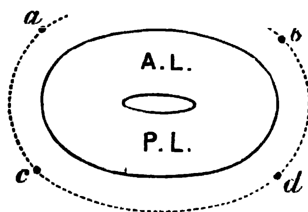


FIG. 165.

on one side. Traction then delivers the body of the uterus, and the broad ligament is clamped, and divided. The same thing is done on the other side, and the uterus is free, and can be removed; the cut broad ligaments are tied with interlocking ligatures, and, to prevent slipping, it is well to pass the upper thread actually through a small portion of the broad ligament. The stumps of the broad ligaments are pulled down, so that the cut surfaces look downwards; the cut peritoneum anteriorly is sutured to the cut peritoneum of Douglas' pouch posteriorly. It is well to pass a suture at each side through the broad ligament stump, so as to fix it, and prevent it retracting into the peritoneal cavity. I generally leave a fine wick of sterile gauze just within the peritoneal cavity. The vagina is packed with a roll of sterile gauze, and the patient put back to bed.

It is, of course, most important to make certain that there is no bleeding. It is generally necessary to pass two or three ligatures to control bleeding from the cut edge of the posterior vaginal wall. This, of course, is done as soon as the posterior vaginal incision is made.

If all has gone well, very little shock, or other disturbance, follows vaginal hysterectomy.

The vaginal gauze is removed in three or four days' time. The fine "wick" drain left just within the peritoneal cavity may be removed in a week or ten days' time. The patient should remain in bed for three weeks after the operation. Before she is allowed to get up, an examination should be made with Sims' speculum, care being taken not to separate the vaginal walls more than is necessary to expose the top of the vagina. Some of the silk ligatures left on the stumps of the broad ligaments will be found to be loose; these are removed. Some will probably be found still not loose; these should be cut short, and left to separate of themselves

Formerly "early" cases of carcinoma of the cervix suitable for operation were treated by removing the whole cervix at the level of the internal os uteri. The operation was known as the high, or supra-vaginal, amputation of the cervix.

This operation gave fairly good results as regards the after-history in early cases limited to the vaginal portion of the cervix. See, for instance, Figs. 144 and 118, showing a specimen (and a section of it) removed by this operation. In this case the patient was known to be well twenty years afterwards. The specimen and sections of it were shown at a meeting of the Obstetrical Society of London, on May 1, 1907.

The chief objection to the supra-vaginal amputation of the cervix was that in some of the cases the aperture of communication with the uterine cavity left after the operation underwent contraction, so much so as to cause marked dysmenorrhœa, and in one case I have known the opening become closed, so as to cause hæmatometra.

As regards vaginal hysterectomy for cancer of the cervix, formerly many operators used strong pressure forceps to secure the broad ligaments, and these were left on for forty-eight

hours. In the description just given of the operation it will be noticed ligatures only are mentioned. Since the use of forceps for securing the broad ligaments was abandoned, the risk of the operation has been greatly reduced; for instance, in my last forty-one vaginal hysterectomies for cancer in which ligatures only were used, there has been no mortality. In one of these cases forceps were used as well as ligatures; in the others ligatures only were used.

As regards Wertheim's hysterectomy, an operation which has only been introduced into this country within a comparatively recent period, I have performed it in forty-six cases. In seven of these it was found impossible owing to the extent of the mischief, which is often only to be ascertained in the course of the operation, to complete the operation. In the forty-six cases there were eight deaths, a mortality of 17·4 per cent. It should be mentioned, however, that six of the eight deaths occurred in the first twenty cases, and only two in the last twenty-six cases. No doubt in the earlier cases, I operated on some which were really much too far advanced for any operation, even for so extensive an operation as Wertheim's.

As regards the after-results, they have not been as favourable as the extensive character of Wertheim's hysterectomy had led one to expect. It is true that the majority of the cases in which I have performed this operation were advanced cases, too far advanced for vaginal hysterectomy to be worth trying.

A consideration of the relative after-results following the supra-vaginal amputation of the cervix, vaginal hysterectomy, and Wertheim's hysterectomy, leads to the conclusion that the most important element influencing the result is getting cases for operation at an early stage of the disease. Then a small operation like the supra-vaginal amputation of the cervix may have a good after-result, still more may vaginal hysterectomy (with its present very low mortality) have a good after-result. While in cases that are advanced, not even such an extensive operation as Wertheim's gives much hope of a prolonged interval without recurrence. On the other hand, in suitable early cases, Wertheim's hysterectomy, being so much the more extensive operation, offers the best chance that the disease may not recur.

Treatment in "advanced" cases.—Here we can only treat symptoms—that is to say, treatment is adopted :—

1. To check the hæmorrhage ;
2. To diminish the offensiveness of the discharge ; and
3. To relieve the pain.

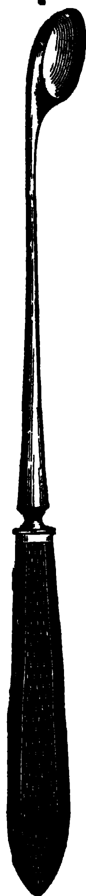


Fig. 166. Simon's Sharp Spoon.

To check the hæmorrhage.

General treatment.—Ergot, either in the form of ergotine pills, or of the liquid extract, may be prescribed ; the patient should remain in bed whenever the bleeding is considerable.

Local treatment.—Plugging.—If the bleeding is very profuse, it will be right, as a temporary measure, to plug the vagina. This should be done through a Sims' speculum, not passed in far.

The vagina is then filled with tampons of wool dipped in glycerine of tannic acid, each tampon having a string attached.

The curette.—When there is a soft growth, such as a "cauliflower" excrescence, even when it has advanced too far for the case to be suitable for complete removal of the diseased tissue, much temporary improvement may at times be secured by thoroughly scraping away all that the curette can be made to remove. Simon's sharp spoon (Fig. 166) answers well for this purpose. After using the curette we may obtain somewhat better results by—

(*a*) Applying the actual cautery to the surface that has been scraped ; or

(*b*) By applying caustics to it.

Marion Sims recommended chloride of zinc solution (300 grs. to ℥j.) for the purpose.

Tampons of wool squeezed fairly dry out of this solution are packed into the cavity ; below them other tampons are packed, soaked in bicarbonate of soda to prevent the caustic injuring the vagina. All the plugs are removed in twenty-four hours. Subsequently the vagina should be douched thrice daily with an antiseptic lotion, till the slough caused by the caustic separates ; this occurs in about a week or ten days.

The following case illustrates both the kind of case suitable for the application of caustics and the details of the method:

J. P., aged 47, married twenty-six years, one child, twenty-three years ago, no miscarriages, was sent up to me by Dr. Corner, on February 4, 1888, as a case of advanced malignant disease of the cervix, with a request that I would do whatever could be done for her in the way of local treatment.

History of the present illness.—Menstruation had been irregular during the last seven years, severe flooding alternating with periods of amenorrhœa. During the early months of 1887 she had had no discharge between her periods. Since June, 1887, she had been losing some blood every day, and there had been floodings also during this time.

Some time between June, 1887, and Christmas, 1887, she began to have pain in the left iliac region, which had persisted. She had noticed herself getting thinner since June, 1887. There had never been any offensive discharge.

Note on admission.—In the situation of the vaginal portion of the cervix there is a mushroom-shaped soft growth, convex downwards. It bleeds freely on touching it. The uterus is much less movable than it should be, and the growth has evidently extended to the vaginal walls. The case was therefore too far advanced to be suitable for the supra-vaginal amputation or vaginal hysterectomy.

February 14, 1888.—Under anæsthesia I scraped away all the soft part of the growth with Simon's sharp spoon, the result of this was to leave a crater-like cavity in the situation previously occupied by the growth. I now applied Paquelin's cautery freely to the whole of the diseased surface, and painted it over with pure carbolic acid.

On *February* 20, as the patient had experienced no inconvenience from the treatment, I was encouraged to apply caustics. The cavity left after the scraping was packed with plugs soaked in chloride of zinc solution (300 grs. to ℥j.), and the vagina filled with plugs squeezed out of strong solution of carbonate of soda The plugs were removed in about thirty hours (having, indeed, been accidentally left in rather longer than was intended)

February 27.—A yellowish-white slough was removed from the vagina. It was in one piece, and formed a complete cast of the ulcerated cavity in the situation of the cervix, and of the upper part of the vagina. Its measurements were as follows: Length, 3¼ inches; breadth, 2⅜ inches; thickness, ¼ to ⅜ inch. *The weight* of the slough was 1 oz. 165 grs. It had no smell whatever The diseased area from which it had separated had the appearance of a healthy granulating surface.

The patient had exceedingly little discomfort following the application of the caustic; but from February 20 to February 27 she had moderate fever, the temperature reaching 101·4° at night.

After separation of the slough the temperature became normal.

Weight on February 4, 1888, 7 st. 5½ lb.; weight on March 5,

7 st. 4½ lb. (allowing for the fever, and the hæmorrhage inseparable from the scraping, this was satisfactory). Before the present illness began she weighed 9 st.

June 4, 1888.—Has been very comfortable since leaving the Hospital. Has had no discharge or bleeding to speak of, and feels her strength and general health greatly improved.

The cavity left by the treatment adopted has contracted very much, so as just to admit the finger easily. The edges of the cavity show a papillary red growth, only projecting about 1/16 inch from it.

Weight, 7 st. 13 lb.

July 5.—There has been a little more discharge since she was last seen. Weight, 7 st. 9 lb.

By the use of the curette, followed either by cautery or by the application of caustics, the bleeding is diminished, and the discharge either ceases to be offensive, or becomes much less offensive, till enough time has elapsed for fresh portions of the growth to die, and become putrid.

The fever, from which these patients suffer, also disappears till the discharge again becomes offensive.

To diminish the offensiveness of the discharge.—Injections of iodine water (ʒij. to Oj. water) two or three times a day, or of weak carbolic (1 to 60), or of tannic acid lotion (℥j. to Oj.), or merely of lead lotion, will be useful for the purpose. An injection of water containing sanitas (℥ss. to the pint) is also useful. As already mentioned, scraping with the curette, or sharp spoon, while it checks the hæmorrhage, is also the most effectual means of lessening the offensiveness of the discharge.

To relieve pain.—For this purpose we use either suppositories of morphine (containing ¼ grain of morphine), or hypodermic injections of morphine. It is well to postpone the use of morphine as long as possible, till in fact the pain is really severe, because the doses have soon to be increased, or repeated at more frequent intervals, to obtain relief.

Soreness of the external parts produced by the irritating discharge may be relieved by applying ung. zinci oleati (B.P.), Hazelin cream, or similar soothing preparations.

CHAPTER XII.

CANCER OF THE BODY OF THE UTERUS.

MALIGNANT disease beginning in the body of the uterus may be carcinoma, sarcoma, or chorion-epithelioma.

The last two are very much rarer than carcinoma.



FIG. 167.—PRIMARY CARCINOMA OF THE BODY OF THE UTERUS.

The papillary soft growth in a very early stage—at an earlier stage than I have ever seen it in elsewhere. The growth is on the posterior wall near the fundus. The uterus as a whole is not enlarged. Uterus removed by abdominal pan-hysterectomy.

Carcinoma of the Body of the Uterus.

This is a much rarer disease than carcinoma of the cervix.

Its etiology is also strikingly different. For instance,

carcinoma of the body of the uterus is almost exclusively a disease of advanced life, while carcinoma of the cervix is not at all rare in women actually or comparatively young.

From about the age of forty-four onwards is the time



FIG. 168—PRIMARY CARCINOMA OF THE BODY OF THE UTERUS

The soft papillary growth. The papillary character of the surface well marked.

of life at which carcinoma of the body of the uterus generally occurs. As a matter of experience most patients with this disease are between fifty and sixty years of age.

Again, as regards fertility, patients with carcinoma of the body of the uterus are generally actually, or relatively sterile,

while, on the other hand, patients with carcinoma of the cervix have generally had large families.

Occasionally, as a rare exception, a patient with carcinoma of the body of the uterus may be found, who has had several children

Clinical types.

In carcinoma of the body of the uterus there are macro-

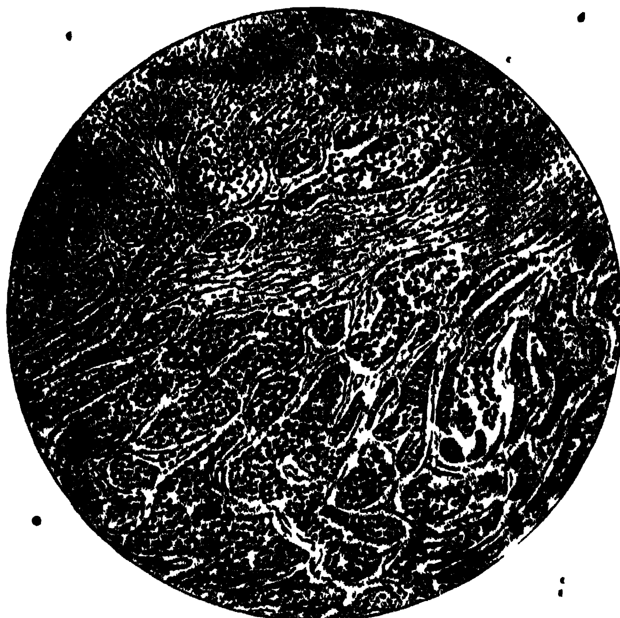


FIG. 169.—Low power. Case 24.* Represents a soft glandular celled carcinoma invading the body of the uterus. The cells are arranged in elongated alveoli, and a strand of muscle tissue crosses the section. At the highest point in the field the growth has undergone granular degeneration and necrosis (Mr. Targett's description for the Clinical Research Association). Patient was known to be well five years after the operation.

scopically four principal varieties. Thus the growth may occur as—

1. A soft papillary mass projecting into the endometrium;

2. A soft flat growth, raised above the general surface of the endometrium, but not papillary;

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

3. A tuberose, somewhat hard growth (Fig. 172); and, finally,

4. There may be no definitely projecting growth, but merely a hard, irregularly ulcerated condition of the endometrium (Fig. 176).



FIG. 170.—CARCINOMA OF THE BODY OF THE UTERUS. (*Microphotograph.*)

Glandular tissue (many layered) is seen invading the deeper muscle bundles of the uterine wall. Epithelial buds are also spreading from the glandular epithelium into the muscle.

Symptoms.—These are the same as in carcinoma of the cervix:

Hæmorrhage,

A discharge, which sooner or later becomes offensive; and

Pain.—But, whereas in carcinoma of the cervix pain is a late feature, in cases of primary carcinoma of the body it may occur early, and be extremely severe.

Physical signs.—*In comparatively early cases* we find the vaginal portion of the cervix normal; on bimanual examination, the body of the uterus is found to be enlarged; and the uterus is freely movable. The speculum will show a sanious discharge coming from the external os. The discharge at this stage may, or may not be offensive. *Gentle*



FIG 171.—GLANDULAR CARCINOMA OF THE BODY OF THE UTERUS. (*Micro-photograph*)

Patient aged 56; nine children; two miscarriages. Bleeding for six months four years after the menopause Abdominal pan-hysterectomy Did well.

passage of the sound shows that the uterus is enlarged, and its withdrawal is followed by more bleeding than was taking place before using it.

In advanced cases.—The uterus is fixed, partly by peritonitis, but also by extension of the disease along the broad ligaments.

Diagnosis.—Certainty in diagnosis can only be attained by dilating the cervix. The finger is then passed into the cavity of the body of the uterus, and recognises some one of the conditions described above—usually soft, friable, papillary masses. Sometimes we may find that the endometrium is hard and irregular, the growth being tough, so that nothing can be removed by a curette for examination. Here the



FIG. 172.—PRIMARY CARCINOMA OF THE BODY OF THE UTERUS
The tuberose hard growth Uterus removed by abdominal pan-hysterectomy.

diagnosis is to be made by taking all the circumstances into consideration, and by recognising that there is no non-malignant condition known to us clinically that would account for the state of the inner surface of the uterus I have had at least two cases of this kind, and on the grounds referred to, having concluded that the disease was malignant, performed vaginal hysterectomy Subsequent examination with the microscope showed the growth in each case to be a

typical carcinoma. If doubt exist as to the nature of the growth, a portion can generally, though certainly not always,



FIG 173—PRIMARY CARCINOMA OF THE BODY OF THE UTERUS. (Case 8 *)

The hard, irregularly ulcerated condition of the endometrium referred to in the text Nothing could be detached with the finger or curette Uterus removed by vaginal hysterectomy, and laid open A Peritoneum B. Cut surface of uterine wall C Growth in endometrium D Cervical canal.

Clinical note—Vaginal hysterectomy, June 8, 1893 Patient was seen once a year afterwards, and remained well up to July, 1906 In 1907 she was seen on May 23, nearly fourteen years after the operation, and then had a malignant growth some $3\frac{1}{2}$ inches up the rectum The vaginal scar was still healthy It is questionable whether this rectal growth should be regarded as recurrence of the original one, or rather as an independent occurrence after such a long interval

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

be removed for subsequent examination with the microscope; to be of any use such a piece must be large enough to be hardened, and to allow of sections being cut. In practice, taking the history, the age of the patient, and so on, with the presence of such masses as those mentioned in the body of the uterus, there can be little doubt as to the nature of the case.



FIG. 174.—PRIMARY CARCINOMA OF THE BODY OF THE UTERUS. (Case 8.*)

Low power. This figure represents a portion of uterine wall composed of interlacing bundles of muscular tissue, and extensively infiltrated by a soft columnar-celled carcinoma. The cells are arranged in tubules and elongated spaces, which have a definite lumen, and the stroma, consisting of uterine muscle, is very scanty (Mr. Targett's description for the Clinical Research Association).

Among conditions which might be mistaken for malignant disease of the body of the uterus are:—

In old people.—

Senile endometritis.

Mucous and fibroid polypi of the body of the uterus.

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

In younger people.—

Fibroids.

Retained products of conception.

Fungous endometritis.

Senile endometritis.—This is a condition in which, clinically, a differential diagnosis is frequently required.* In such



FIG 175—PRIMARY CARCINOMA OF THE BODY OF THE UTERUS (Case 8 *)

High power In this figure the columnar character of the cells is shown, and, although the tubules and alveoli everywhere exhibit a central cavity or lumen, yet there are abundant signs of epithelial proliferation, and the cells encroach on the central space In the well marked tubular structure of the growth this specimen resembles the so called malignant adenoma (Mr. Targett's description for the Clinical Research Association).

cases there is a purulent discharge, which may be slightly blood-stained from time to time, and the discharge may be offensive.

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p 224.

But in senile endometritis :—

As to the symptoms.—There is no wasting. Pain is either absent, or slight. The bleeding is only slight.

As to the physical signs.—The body of the uterus is slightly, if at all, enlarged, and indeed it may be quite small ;



FIG 176—PRIMARY CARCINOMA OF THE BODY OF THE UTERUS. (Case 7*)
The hard, irregularly ulcerated condition of the endometrium referred to in the text, where nothing could be removed with the finger or a curette. Uterus removed by vaginal hysterectomy. Patient well fifteen years afterwards. The specimen and sections of it were shown at a meeting of the Obstetrical Section of the Royal Society of Medicine on October 8, 1908 A Peritoneum. B. Cut surface of uterine wall. C Growth in endometrium. D. Cervical canal.

after dilating the cervix, the finger finds the surface of the mucous membrane quite *smooth*

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p 224.

Mucous polypi.—A mucous polypus may develop in the body of the uterus after the menopause, and give rise to bleeding. The cervix must be dilated, and the growth removed. A piece of it must be examined under the microscope before a certain diagnosis can be made.



FIG. 177.—VILLOUS CARCINOMA OF THE BODY OF THE UTERUS. (Case 7.*)

Low power. This figure depicts the general characters of the growth under a low power. In the muscular tissue of the uterus there are spaces of various sizes, from simple gland-like tubules to cysts visible to the naked eye, and filled with a complicated epithelial new growth. This growth has resulted from proliferation of the columnar epithelium lining the tubules, and has assumed in part the form of intra-cystic villous papillomata. At the periphery of the largest space the malignancy of the growth is shown by the extension of solid processes into the adjacent uterine tissue (Mr. Targett's description for the Clinical Research Association.)

Similarly, fibroid polypi and submucous fibroids also may be found in the endometrium, causing bleeding, even in very old people. I have seen several examples of this.

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

In younger people there is always a strong probability against the presence of carcinoma of the body of the uterus.

Fibroids.—The diagnosis is sometimes a matter of some difficulty. Generally, however, in the case of fibroids there is a history of symptoms extending over a long period—at

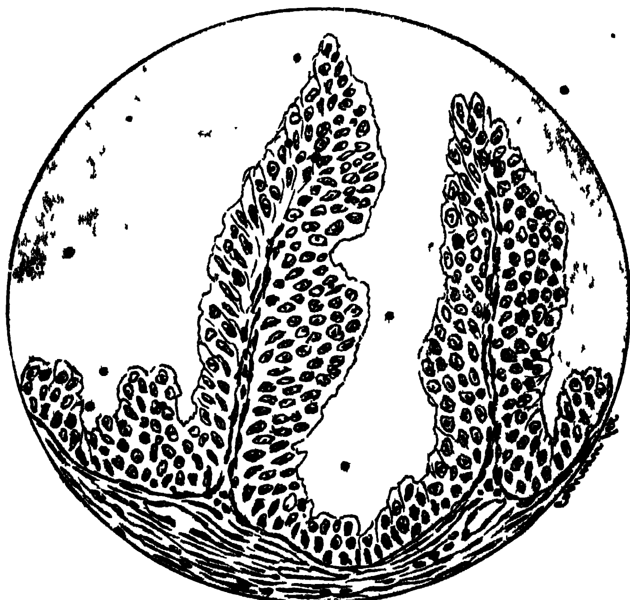


FIG. 178.—VILLOUS CARCINOMA OF THE BODY OF THE UTERUS. (Case 7 *)

High power. In this figure two of these intra-cystic papillomata are represented. In the vascularity and delicacy of their structure they closely correspond with the fimbriated papilloma of the urinary bladder. The growth may be described as a villous carcinoma. (Mr. Targett's description for the Clinical Research Association.)

all events, over a longer period than in cases of carcinoma. The pain also is often much more severe in those suffering from cancer of the uterine body than in cases of uterine fibroids. Where there is any doubt, it is well not to delay dilating the cervix. In one of my own cases successfully treated by extirpation of the whole uterus, I was for some

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

time inclined to regard the case as one of fibroids. Fortunately I dilated the cervix, and felt the friable papillary masses diagnostic of cancer. It should be remembered that

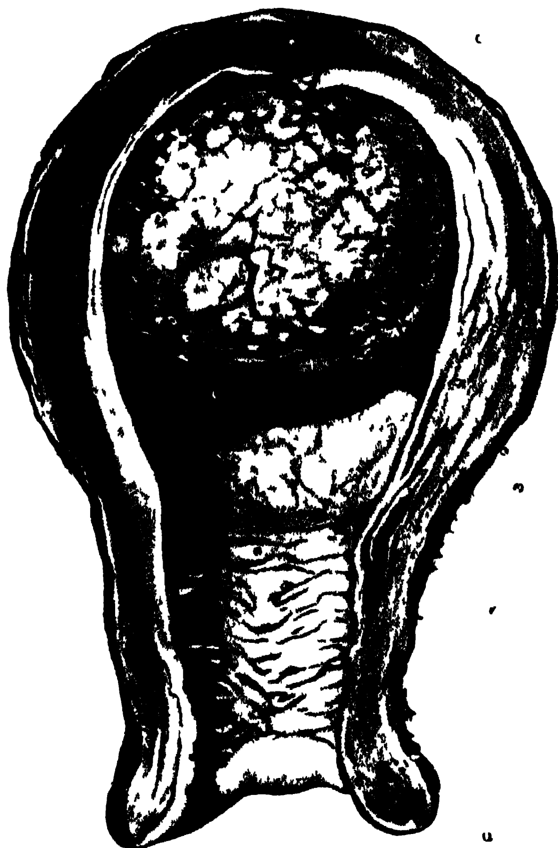


FIG. 179.—CARCINOMA OF THE BODY OF THE UTERUS. (Case 24.*)

The soft papillary growth—a more advanced stage than represented in Fig. 167. The papillary character of the surface is only slightly marked.

both conditions may exist together—carcinoma of the body of the uterus and fibroids. This association is far from uncommon. (See Figs. 181, 182, 183.)

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

As to retained products of conception.—The mere fact that the patient has been pregnant establishes a probability against carcinoma of the body of the uterus—a probability which is stronger the more children she has had. There will probably not be the severe pain of a carcinoma of the body.

Dilating the cervix and removing the mass thoroughly with the finger or curette (with all the precautions essential

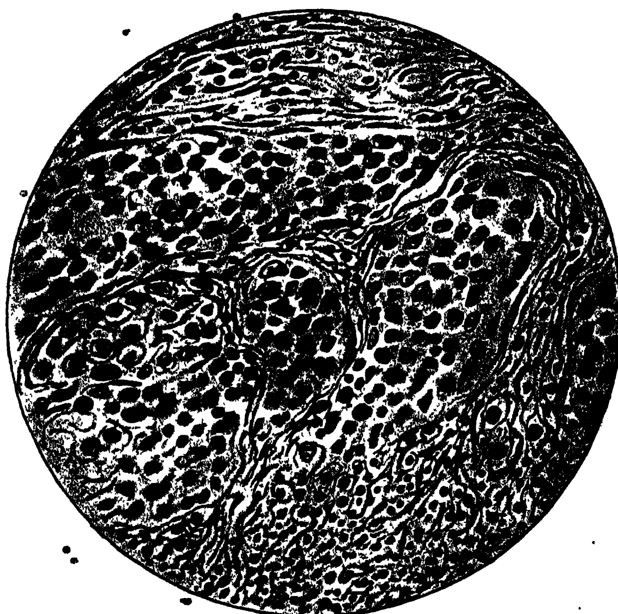


FIG. 180.—High power. Case 24.* In this figure the cells are seen to be of moderate size and fairly uniform shape. There is no indication of a tubular arrangement, and the small round nuclei indicate leucocytes invading the degenerate areas (Mr. Targett's description for the Clinical Research Association).

in every intra-uterine manipulation) will be followed by a rapid recovery. Whereas, if the intra-uterine substance had been malignant, this treatment would only produce an improvement of a very temporary nature.

Fungous endometritis.—A doubt occurred at one time in

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

the case narrated at page 169, as to whether it might not be malignant disease of the body: the age of the patient, the duration of the symptoms, and the absence of offensive discharge and pain, were the points relied on in excluding it.

Subsequently a microscopical examination of the material



FIG. 181.—SECTION OF A UTERUS GREATLY ENLARGED BY FIBROIDS, FROM A SINGLE WOMAN AGED 67.

There was a small patch of adeno carcinoma at the highest point of the endometrium, near the top of the glass rod in the photograph. The patient was known to have had fibroids for at least thirty years, and had been told they would disappear, or cease to give trouble after the menopause. The patient was well for nine or ten years after the menopause, and then metrorrhagia started. The mass removed was as big as the pregnant uterus at the seventh month. The patient did well.

removed (and the complete recovery of the patient) showed that it was a non-malignant formation.

Treatment.—As in the case of carcinoma of the cervix, the treatment differs according as the disease is in a com-

paratively early stage, or in an advanced stage. Carcinoma of the body of the uterus runs a much less rapid course than carcinoma of the cervix, so that a much larger proportion of the cases is seen at a time when they are still operable. Similarly the prognosis as regards recurrence after removal of the uterus is much more favourable—at least twice as

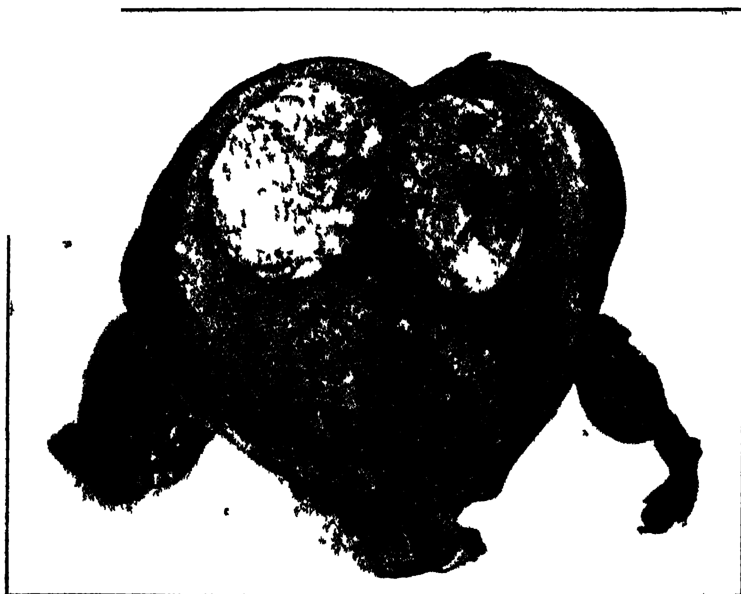


FIG. 182.—CARCINOMA OF THE BODY OF THE UTERUS.

A large interstitial fibroid is seen at the upper part of the body near the fundus. The malignant growth occupies the lower half of the endometrium. The cervical canal is healthy. The uterus was removed by abdominal pan hysterectomy. It was shown with sections of the malignant growth (glandular carcinoma), at a meeting of the Obstetrical Society of London in October, 1902. The patient was a single woman aged 55. Menopause at 50. History of metrorrhagia for six months. She did well after the operation.

favourable in my experience—than in cases of carcinoma of the cervix.

In early cases.—Given that the case is in an early stage—that is to say, that we are as certain as a careful examination under an anæsthetic can make us:—

1. That the uterus is freely movable;
2. That no thickenings can be felt in the direction of the

broad ligaments, or utero-sacral ligaments, such as would probably mean extension of the growth in those directions; and

3. That the lumbar glands are not involved—

the right treatment is to remove the uterus. This may be done either by the abdominal or the vaginal route.

If the patient is in good condition and not too fat,

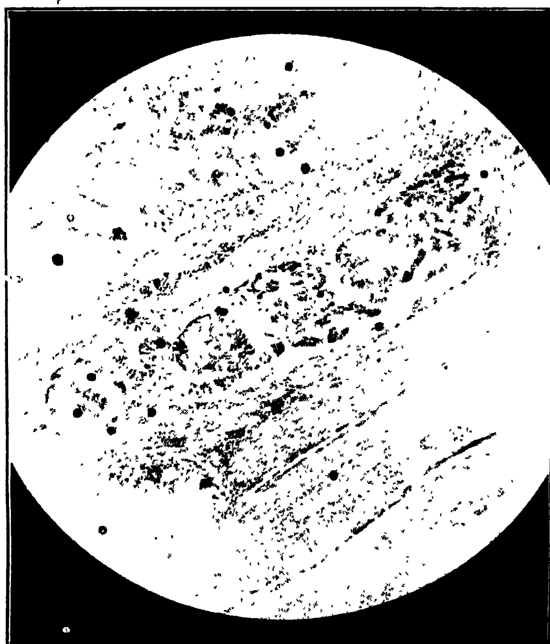


FIG 183.—UTERUS WITH FIBROIDS AND CARCINOMA OF THE BODY OF THE UTERUS SPREADING INTO THE CERVIX.

The lower part of the cervix is not affected. Abdominal pan-hysterectomy. Did well.

abdominal pan-hysterectomy is to be preferred. Complications such as pyosalpinx, and adhesions of the intestine, omentum, or bladder, to the body of the uterus, are obviously much more safely dealt with when operating by the abdomen. When the patient is excessively fat, or not a good subject for a severe operation, vaginal hysterectomy, if the other indications are favourable, and the uterus is not too large, is to be preferred.

PLATE VIIIA.



In performing abdominal pan-hysterectomy for carcinoma of the body, the manipulation of the body of the uterus in the course of the operation generally squeezes out some of the growth and discharge into the top of the vagina. The vagina should therefore be swabbed out with pledgets of sterile gauze, held in a long sponge-holder, before the vagina is opened from the abdominal aspect.

In other respects the operation is similar to abdominal pan-hysterectomy for fibroids, which has been already described.

Vaginal hysterectomy has also been described under carcinoma of the cervix. Occasionally the size of the uterus may create a difficulty. This may be overcome by splitting the uterus into two halves, or cutting wedges out of it till the size has been sufficiently reduced.

The following is an account of the first case in which I extirpated the uterus for cancer of the body:—

A. R., aged 58, a washerwoman, was married in 1859; the husband left her three and a half months after marriage; she had had one child, still-born, and no miscarriages Admitted into the London Hospital, February 25, 1886, complaining of having been constantly "unwell" for ten months, and for the last two months of having had very severe pain at the bottom of her "stomach," reaching down the thighs to the knees. Also she had had a watery discharge slightly coloured with blood, and a little offensive at times.

Family history.—No history of cancer or phthisis.

History of the present illness.—The symptoms first appeared ten months ago, as above mentioned. Shortly before the commencement of her illness she had lost some money in her business, and fretted a good deal about it.

In May, 1885, the first thing she noticed was that she became "unwell" very suddenly; the discharge was of a deep red colour, and came away in clots. She had no pain, and the discharge continued for six weeks or two months; it then left her for a day or two, but came on again as badly as ever. She lost flesh, and latterly had lost her appetite. The pain and the watery reddish-yellow discharge came on about two months before admission, the pain a little before the discharge. For the last month the discharge had been offensive.

The pain soon became very severe indeed; she felt it most in the hypogastric region, and down the inside of her thighs as far as the knees.

First of all it was of a throbbing character, and latterly like something cutting her severely. The pain was always much worse at night, and kept

her awake; she was often "doubled up" with the pain; it was never relieved by lying down, but, if anything, was then worse.

Menstrual history.—The only feature of interest was that the menopause occurred comparatively early, in 1866, when she was only thirty-eight. Since then she had "seen nothing" till ten months ago.

Present state, February 26, 1886.—Abdomen a little prominent below umbilicus; a little, but not very, tender; abdominal examination detected nothing else abnormal.

Vulva.—Some erythematous vulvitis, such as is produced by irritating discharges. On asking the patient to strain, a watery yellow discharge escaped from the vagina.

Vaginal examination.—Vagina short; one very sharp "bridle" ran from the left side of the cervix to adjacent vaginal wall. Vaginal portion of cervix normal. An irregular hard lump the size of a cobnut felt

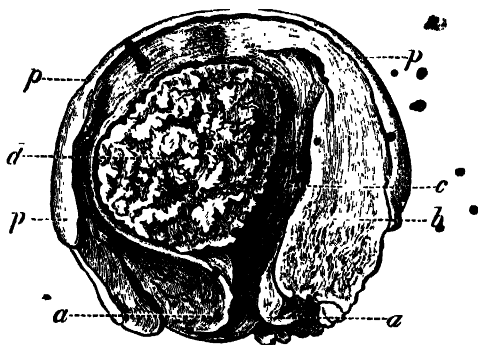


FIG. 184.—PRIMARY CARCINOMA OF THE BODY OF THE UTERUS.

This is a drawing of the uterus extirpated per vaginam in the case of A. R. The uterus has been laid open along the left side. The growth in the cavity of the body has a papillary surface. The cervix is healthy. *a.* Vaginal portion of the cervix. *b.* Cut surface of uterine wall. *c.* Part of the mucous membrane of the body that has not been involved by the growth. *d.* The malignant growth. *p p p.* Cut edge of peritoneum.

posteriorly, apparently in supra-vaginal cervix. Examination caused a great deal of pain. Chloroform was therefore given, and a thorough examination made. The uterus was freely movable. The body could be felt bimanually lying to the right of the middle line, the position being one of anteversion; body enlarged. Through the speculum, before passing the sound, some blood-stained discharge was seen escaping from the external os. Small fragments of soft, brain-like material appeared in the discharge escaping *after* passing the sound.

March 1, 1886.—Uterus extirpated per vaginam. The operation lasted one hour and forty-eight minutes. The uterus on removal was found to weigh seven ounces (the weight of the uterus in a woman of fifty-eight would be normally one ounce or less); on opening it an extensive

papillary growth was seen projecting into the cavity of the body (Fig. 184). Sections of the growths in the uterus were examined by Professor Victor Horsley, and found to be carcinomatous. Sections of the nodule felt in the supra-vaginal cervix were also examined by him. It proved to be an ordinary fibroid.

Subsequent progress.—Highest temperature on the evening of March 2, 102·2°. From and including March 5, temperature was normal, and patient made an uninterrupted recovery.

Previous to the operation the temperature reached about 100° at night, falling to normal in the morning.

The patient was seen from time to time subsequently. She enjoyed good health, and was free from pain. In October, 1886, an examination was made, and no return was found. She was not seen again until the end of January, 1887, when, though about her work as usual (mangling), she had been getting thinner again, and for about a month had had bad pains across lower part of the back, and down the left leg, and a profuse watery discharge, at times red; but she had not lost much blood; she had been suffering from boils. She would not be examined on that occasion, and it was not for some week or two after that an examination could be obtained. On vaginal examination then, a lump the size of an orange was felt filling the upper part of the vagina; it was fixed, and the surface towards the vagina was ulcerated, and bled readily.

Patient was readmitted to the Hospital, and gradually went from bad to worse, dying on July 7, 1887—sixteen months and seven days after the operation.

For some weeks before her death a hard mass could be felt in the umbilical region.

Post-mortem.—There was found some recent adhesive peritonitis in the pelvis; a hard mass occupied the greater part of the pelvic cavity, particularly filling it on the left side. The mass in the umbilical region was found lying on the lumbar vertebræ, and was the size of an orange; it appeared to be due to secondary deposit in the lumbar glands. Hydronephrosis of the left kidney. No secondary deposits in the liver, lungs, or other organs.

Right kidney fairly normal, but its capsule could not be separated without causing some tearing. There had been no symptoms of uræmia.

The following is an account of the first case in which I performed abdominal pan-hysterectomy for carcinoma of the body of the uterus:—

A lady, aged 54, came to me on February 12, 1900. She had been married for fifteen years, but had never been pregnant. She had been quite regular till the age of fifty, when she had synovitis, and stayed in bed for some time, after which menstruation ceased altogether. In April, 1899, she began to have some vaginal discharge. It was at first colourless, but was afterwards sometimes yellow, and sometimes of a brown colour,

and continued up to the time I saw her. She had had no pain at all, and did not think she had lost weight. The discharge had at times an unpleasant smell. There was nothing else in the history of any special interest.

Nothing abnormal was detected on examining the abdomen. On vaginal examination the external genitals were redder than normal, and slightly sore-looking, and there was some yellow discharge at the vaginal orifice. The vagina was extremely narrow, and examination with one finger caused a good deal of discomfort. On this account the examination was not very satisfactory; but as far as could be made out the uterus was freely movable, and the external os rather small. There was nothing abnormal as regards the vaginal portion of the cervix. The extreme narrowness of the vagina was shown by the fact that the patient could not bear the smallest Fergusson's speculum to be passed. A small rectal speculum was therefore passed into the vagina. It was rather less than half the length of an ordinary Fergusson's speculum, and it only showed the lower two inches of the vaginal walls, which were thinly covered with the yellow discharge above mentioned.

I advised the patient to have the cervix dilated sufficiently to allow the interior of the body of the uterus to be examined with the finger. She consented to have this done; but as she wished to return to the north of England for a fortnight, it was not till March 1 that she entered a nursing home.

The next day, with the usual antiseptic precautions, a specially prepared laminaria tent was inserted into the cervix. To do this, owing to the narrowness of the vagina, it was necessary to have the patient anæsthetized. Speaking from memory, I believe I had only once before up till then found it necessary to have a patient anæsthetized for the insertion of tents, so that it will be seen that the narrowness of the vagina was such as to cause real difficulty in dealing with the case.

On March 3 the dilatation of the cervix was completed under anæsthesia with Hegar's dilators. A growth was found very high up in the endometrium. A portion of it was removed for microscopical examination, though I felt little doubt after the digital examination of the endometrium that the growth was malignant. The portion of growth removed was sent to the Clinical Research Association, and the report came back that it was carcinomatous. The patient was accordingly advised to have the uterus removed, and to this she consented.

Operation, April 11, 1900.—The preliminary dilatation of the cervix for diagnosis had been so difficult, on account of the narrowness of the vagina, that I decided to remove the uterus by abdominal pan-hysterectomy. The method was the same as that already described in the treatment of fibroids. In this case the vagina was douched with perchloride of mercury lotion (1 in 1,000) before the operation, but I did not make any attempt to occlude the cervix by a suture, or to pack it before beginning the abdominal section. The right uterine appendages were removed with the uterus, but the left appendages were not removed. The ligatures on the uterine arteries, and on the vessels in the cut edges

of the vaginal walls were left long, and drawn down into the vagina by long Wells' forceps passed up into the vagina by an assistant. An iodoform gauze drain was drawn down from above into the vagina, about an inch of it being left projecting into the peritoneum. The abdominal wound was completely closed.

The patient made an uninterrupted recovery, and the ligatures came away at the end of the fifth week.*

Description of the specimen.—"The uterus has been laid open by an incision from the external os to the fundus through the anterior wall (Fig. 167). The extreme length of the uterus is three inches. At the extreme highest point of the endometrium, and extending downwards for an inch and a quarter on the posterior wall, is a new growth raised only slightly above the general surface of the endometrium. Its surface is faintly papillary. A sagittal section has been made through the growth and the wall of the uterus from which it springs. This shows that the growth penetrates deeply into the uterine wall, the limit of its penetration to the naked eye being marked by a sinuous irregular whitish border."

A portion of the growth was sent to the Clinical Research Association, and Mr. Targett's report on it was as follows:

"The wall of the uterus is deeply invaded by a very soft columnar-celled carcinoma. The growth is much degenerated, and therefore stains badly. It is a primary carcinoma of the body of the uterus."

In advanced cases.—Palliative treatment such as was recommended for carcinoma of the cervix, omitting caustics and the cautery, is all that can be advised.

SARCOMA OF THE UTERUS.

This is a rare disease; it is impossible to certainly distinguish between carcinoma and sarcoma of the uterus, except by the microscope; so that clinically these two diseases may be grouped together as malignant disease of the uterus. Similar treatment is required whether the disease be sarcoma or carcinoma. Sarcoma of the body of the uterus is commoner than sarcoma of the cervix. When it occurs in the body of the uterus, it may be found as circumscribed nodules in the uterine walls, or as a diffuse growth, forming more or less irregular projections on the surface of the mucous membrane.

Etiology. –*Fertility.*—Twenty-five out of sixty-two in Gusserow's series of cases were sterile.

* I had a letter from her dated August 23, 1902, saying she was quite well.

Age.—In the same series the ages were as follows :—

2 under 20.
3 between 20 and 30.
14 „ 30 „ 40.
26 „ 40 „ 50.
14 „ 50 „ 60.
2 „ 60 „ 70.
1 over 70.

The symptoms in advanced cases are the same as in carcinoma.

In early cases the discharge is said to be less offensive, and pain less marked.

In 1903 I saw a case of sarcoma of the cervix occurring in a young unmarried lady only seventeen years of age. There were numerous secondary deposits in the vagina. Nothing in the way of radical treatment seemed justifiable. I cut off the large sarcomatous mass growing from the cervix (it was so large that it protruded from the vulva) and cauterized the secondary deposits in the vagina as thoroughly as possible.

Diagnosis.—The question will be, in each particular case, is the disease malignant (*i.e.*, carcinoma or sarcoma)? or non-malignant? And the non-malignant conditions from which sarcoma has to be diagnosed are the same as those mentioned under carcinoma.

Chorion-Epithelioma.

This is an extremely malignant growth, which almost always occurs primarily in the uterus, though occasionally it may be primary in the vagina. The growth generally appears within a few weeks or months of labour or miscarriage. In quite a large proportion of cases, variously estimated as from 25 to 50 per cent., the preceding pregnancy has been one in which the ovum had degenerated so as to form a hydatidiform mole.

To the naked eye the masses of growth resemble blood-clot. Microscopically, when the growing margin of the growth is examined it is found to consist essentially of two kinds of tissue :—

1. Masses of separate nucleated cells.

2. Masses of protoplasm, nucleated, but not divided into separate cells.

The separate nucleated cells are derived from Langhan's layer of the chorionic villus, and the nucleated masses of protoplasm, not so divided into separate cells, are derived from the outer layer of the chorionic villus—the syncytium.

Formerly cases of the kind were taken to be sarcomata, and the case given below was at the time (1885) thought to be one of sarcoma. Subsequent investigation has shown that it really was one of chorion-epithelioma. From what has been said it is evident that the disease is derived from the ovum, and not from the maternal tissues. Formerly, when the disease was erroneously thought to arise from the tissues of the endometrium, it was called deciduoma malignum.

The disease is characterized by a rapid course, and early formation of secondary deposits in the vulva and vagina, which may easily be recognised on examination, and by secondary deposits also in the lungs and other organs, which are found on post-mortem investigation.

Clinically the course of the disease is marked by hæmorrhagic discharges, frequently very offensive, from the uterus. There is fever, and marked cachexia The sudden formation of secondary deposits in the vagina or vulva is remarkable. An examination may be made on one occasion and the vagina and vulva may be found to be quite healthy. Within two days it may happen, if another examination is made, that secondary deposits are found in both the vagina and vulva. These take the form of circumscribed nodules, which vary in size from about that of a walnut to that of a hen's egg. They are situated under the mucous membrane of the vagina, or vulvar skin, and have a purple colour. When the mucous membrane or skin is ulcerated over the nodule, hæmorrhage, which may be profuse, occurs from the opening. The only treatment that offers any hope of relief is removal of the uterus if the disease is recognised in time. Any accessible secondary nodules should be removed at the same time. Curiously it is claimed that after removal of the uterus secondary nodules may disappear, and recovery occur.

The following case was at the time (1885) thought to be

one of sarcoma of the uterus, but in the light of subsequent investigation it was no doubt really one of chorion-epithelioma.

E. L., aged 50, married twenty-nine years, eight children, the last eleven years ago, no miscarriages, was admitted into the London Hospital, June 27, 1885. She complained of having had a sudden attack of flooding about a month ago; it lasted an hour, and she lost a pint of blood. Two days after she had another similar attack; since then she was confined to bed till she came to the Hospital. She once tried to walk across the room about a week after the second attack of bleeding, but the exertion was immediately followed by a third flooding. After each flooding she fainted and vomited, but the attacks were not attended by any pain. She had been losing flesh the last three months, and for the last three or four months had had a watery discharge from the vagina of a "dirty" colour. A month ago (that is, about the same time the flooding came on) she noticed a lump protruding from the vulva.

Previous history.—Patient began to menstruate at sixteen; she was quite regular till her marriage; the flow lasted a week, and she had no pain at her periods. During the last nine years, patient said she had had altogether six attacks of profuse flooding, the one which began a month ago was the sixth. The *first* attack of bleeding occurred nine years ago, and confined her to bed for five weeks. The *second* attack was three years after this. Between the attacks the patient said she had been quite regular.

Present condition, June 29, 1885.—*Vulva*.—On inspection, without separating the parts, a greenish-black mass is seen between the labia majora posteriorly. By separating the labia the mass is seen to be oval, with its long diameter from before back, measuring 1⅝ inch; transversely 1 inch.

The exposed surface of the mass is indistinctly divided by radiating furrows into three lobes. On tracing it up, the mass is found to be attached to the posterior vaginal wall by a broad pedicle, which extends downwards as far as the posterior edge of the vaginal orifice.

The part of the tumour that is within the vagina is covered with vaginal mucous membrane of a pale pink colour, like that elsewhere in the vagina. But this covering ceases abruptly where the mass is exposed to the air, and, as already mentioned, the surface of the exposed portion is of a greenish-black colour.

About half an inch up the vagina on the right side, a second mass the size of a walnut is to be felt beneath the mucous membrane. At the most prominent part of this mass is an area the size of a threepenny piece, of a dark purple colour. Here the vaginal mucous membrane has become attached to the subjacent growth, and has ulcerated. Elsewhere the mucous membrane covering the tumour is normal. The mass has an elastic, semi-fluctuating feeling.

Uterus.—The condition of parts in the vagina interferes with a satisfactory examination of the uterus, but it feels heavier than normal, and freely movable.

PLATE IX.

CHORION-EPITHELIOMA OF UTERUS. (Case of E. L., p. 334.)

Uterus laid open from behind. The malignant growths are shown dark red as they appeared in the recent state.

[Between pp. 334-5

PLATE IX.



To face page 334

PLATE X.

CHORION-EPITHELIOMA. (Case of E. L., p. 334.)

FIG. 1.—Anterior surface of uterus. The peritoneum is discoloured a purplish tint opposite the large growth at the fundus shown in Plate IX.

FIG. 2.—Drawing showing the secondary growths in the lung. Both lungs were similarly affected.

PLATE X.



FIG 1



FIG 2

To follow Plate IX.

The temperature since admission has varied from normal to 100.4°. Patient is thin and sallow; her general appearance suggests malignant disease; a gland can be felt in each groin, but neither of them is enlarged.

On July 2, 1885, the growths were removed, and after their removal (which was easily effected) a careful examination was made, the patient being still under the influence of an anæsthetic.

The uterus was freely movable; its surface appeared smooth, and free from any irregularity. The sound passed 3½ inches without causing any bleeding.

After the operation the patient had an attack of septicæmia, from the effects of which she sank on July 7.

Post-mortem.—Three distinctly-circumscribed growths of a deep red colour and soft consistence were found in the walls of the uterus. The largest occupied the thickness of the uterine wall at the fundus. It measured vertically 1¾ inch and horizontally 2½ inches. The peritoneal surface of the uterus opposite this growth was discoloured and of a purple tint, but was quite smooth. The lowest growth was partly in the wall of the cervix, partly in that of the body of uterus (see Plates IX and X). There was no peritonitis. There were numerous secondary growths about the size of peas, but individually varying considerably in size, in both lungs. None elsewhere. The kidneys were granular.

Microscopical examination of the growths at that time led to the conclusion that they were mixed round and spindle-celled sarcomata. Recent microscopical examination of a portion of the uterine growth by my colleague, Dr. Russell Andrews, when Obstetric Tutor at the London Hospital while re-arranging the gynæcological specimens in the London Hospital Museum, led to the discovery that the appearances of the growth under the microscope were very similar to those found in cases of chorion-epithelioma.

The second case came under my notice in December 1896. It is undoubtedly identical with the cases that have been described as chorion-epithelioma.

The notes of this case are as follows:—

E. W., a married woman aged 24, was admitted under my care into the London Hospital on December 10, 1896, complaining of pain in the back, bearing-down pain, and a constant red discharge since a supposed miscarriage nine weeks previously.

Previous history.—She had had a cough since she was fifteen years of age, and had attended Victoria Park Hospital. She said her left lung was affected. She had small-pox eight years ago, and since then had been a little deaf. She had been married twelve months, and thought that she had had three miscarriages. The first miscarriage was in April, 1896, when she believed herself to be two months pregnant; the second was in August, 1896, when she thought herself to be five or six weeks

pregnant; and a third was nine weeks before she was admitted into the Hospital.

Menstrual history.—The catamenia began when she was ten years old. She then "saw nothing" for ten months, and was very irregular till the time of her marriage, there being intervals of two, three, and four



FIG 185 —Chorion-Epithelioma The uterus removed in Case 29 * laid open along the anterior wall The area of disease is at the fundus.

months between the periods, The periods were scanty, and attended with pain in the hypogastric region and back She sometimes had to keep her bed during her periods She had had no trouble with her water. The appetite was generally bad, and the bowels generally constipated.

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

Family history.—Her father is alive. All the family have suffered from "weak chests."

History of the present illness.—The patient said that she had had a red vaginal discharge ever since the first miscarriage, which occurred in April, 1896. The discharge was more profuse when the patient was up and about. She had also had more or less pain since the first miscarriage. Nine weeks before her admission, when the last miscarriage occurred, she supposed herself to be three weeks pregnant. She was attended by a doctor, and "a small piece of flesh came away."

At the time of her admission the case appeared to be an ordinary one of metrorrhagia, due to incomplete abortion. The note made at this time was as follows :—

"Nothing abnormal can be felt on abdominal examination On vaginal



FIG. 186.—CHORION-EPITHELIOMA OF THE UTERUS Uterus from the case of L W. (Case 29 *)

The uterus has first been laid open along the anterior wall, and then the posterior wall has been cut vertically almost up to the peritoneum A Scattered nodules of growth. B Fibroid in posterior wall C. Anterior cut edge of posterior wall. D. Cut anterior wall of uterus

examination there is recent blood about the external parts and in the vagina The os is not patulous Fresh blood is seen in the os The uterus is freely movable, and evidently somewhat enlarged"

December 21, 1896 —Two special laminaria tents were inserted on the evening of December 20, and at 3 30 p.m on the 21st the dilatation of the cervix was completed with Hegar's dilators The finger was then passed into the uterus, and came upon a projecting mass about the size of a

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

walnut, part of which was easily detached. The mass was situated on the posterior wall near the fundus, and to the right side. Most of the mass was easily detached with the finger, but there was no line of demarcation between the mass and the underlying wall of the uterus. As successive portions of the mass were scraped away, the finger kept going more and more deeply into the substance of the uterine wall, so that the condition was altogether unlike that found in ordinary cases of incomplete abortion. The material removed was reddish yellow, and somewhat friable. I had on one previous occasion come upon a condition having some resemblance to that found in this case. This was in a case of hydatidiform mole. The

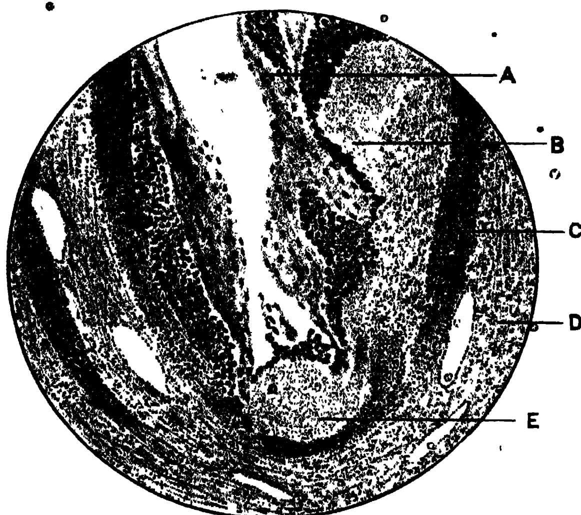


FIG. 187.—CHORION-EPITHELIOMA OF THE UTERUS. (Case 29.*)

A low-power sketch of a process of growth invading the uterine muscular tissue. The peripheral layers of cells are formed of rounded, well-defined elements having a distinct nucleus ; but the centre of the process consists of irregular plasmodial masses of nucleated protoplasm without any definite cell-outlines. In addition, there is much small-celled inflammatory infiltration of the muscular substance, and large extravasations of blood around the process of growth (Mr. Targett's description). A. The plasmodial layer or syncytium. B. Layer of indifferent neoplastic cells. C. Small-celled inflammatory change. D. Uterine muscular tissue. E. Fibrin from old extravasations of blood.

bulk of it came away spontaneously, and it was some weeks afterwards, when the interior of the uterus was explored on account of a persisting metrorrhagia, that the condition referred to was met with. Portions of the hydatidiform mole were projecting at the fundus, and were easily

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

removed, but the finger did not come down on to firm healthy uterine wall. As more and more of the separable material was detached, the finger kept getting more and more deeply into the wall of the uterus, till it was very nearly, if not quite, in contact with the peritoneal coat. In the case of hydatidiform mole referred to, although one felt doubtful as to whether the whole of the mole had been removed, the patient ultimately made a completely satisfactory recovery.

In the present case (E. W.) pure tincture of iodine was applied to the whole of the endometrium. The uterus was washed out, and a strip of



FIG. 188.—A high-power sketch of a portion of the growth, which at this spot is composed of irregular polynucleated plasmodial masses (A) and strands of round well-defined cells (B). The remainder of the field consists of recent blood clot (C) and fibrin. (Mr Targett's description.) Case 29.*

iodoform gauze was left in the vagina This was removed on the following day. The temperature subsequent to the dilatation did not rise above normal; but the red discharge persisted more or less during the patient's stay in the Hospital on this first occasion, although she was constantly taking ergot and having hot vaginal douches. She went out on January 4, 1897. At that time her weight was 6 st 7 lb.

Readmission.—The patient was readmitted on January 13, 1897, as the

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p. 224.

metrorrhagia had persisted, and there had been two floodings during the few days she was at home On one occasion it was said that half a chamberful of blood with clots came away.

Examination, January 21, 1897—The patient was not markedly anæmic On examining the abdomen, nothing abnormal could be felt. On vaginal examination there was a little blood about the vaginal orifice, and the uterus was considerably enlarged, being about the size of the pregnant uterus at seven or eight weeks It was freely movable and soft. She was treated with hot vaginal douches and took 3 grs of ergotine three times a day up till the 29th During this time there was no



FIG 189 This represents, under a higher power the rounded indifferent cells in the centre of the field They have a darkly stained nucleus, a clear cell body, and a well defined outline The plasmodial masses, or syncytium, are in the form of flattened layers of very granular protoplasm, which is nucleated, but not clearly divided into cells (Mr Targett's description) Case 29 *

improvement She suffered from a good deal of pain in the lower abdomen, and backache, and pain down the left leg as far as the knee and the red discharge persisted On January 30 the cervix was again dilated, and the following note was made as to the condition of the endometrium —

"Tracing the anterior wall of the uterus from left to right, with the

* The number refers to the Table of forty consecutive vaginal hysterectomies performed for cancer in the author's monograph "Cancer of the Uterus," p 224.

finger in the uterus, it was found to be smooth. The posterior wall was smooth on the left side, but about the middle it became rough, and on the right side was felt an edge, beyond which there was an irregular chasm, on the floor of which several brittle irregular masses could be felt, and portions were easily broken away with the finger. Bimanually, when the finger was on the floor of this chasm, there seemed to be little or nothing but peritoneum between the hands." At this time I said to those who were present that, but for the age of the patient, I should have no hesitation in saying that the case was one of carcinoma of the body of the uterus, and that I felt practically certain that the disease was malignant, and that it had considerable resemblance to cases that had been described under the title "deciduoma malignum."

Operation, February 11, 1897.—The patient was anæsthetized with ether, and placed in the lithotomy position. Vaginal hysterectomy was then performed, the principal steps of the operation being as follows:—The anterior fornix was first incised and the bladder separated as high as the internal os. Then the posterior fornix was opened, and the cervix cleared to the same height. The anterior and posterior transverse incisions were then joined by lateral incisions, bleeding vessels being secured with pressure forceps. Douglas' pouch was opened. Then the vesico-uterine pouch of the peritoneum was opened, and the lateral attachments of the uterus were secured with pressure forceps, and divided. The left side of the uterus was freed first and delivered into the vagina, and afterwards the right broad ligament was secured and divided. The uterus was then removed. Iodoform gauze was packed into the vagina, and the upper part of the gauze projected into Douglas' pouch. The patient made an uninterrupted recovery. The pressure forceps were removed on the fourth day, the temperature on that occasion reaching 101°, the highest point it reached throughout the whole period subsequent to the operation. After the tenth day the temperature never rose above 99·2. She was examined on March 15. On abdominal examination nothing abnormal was to be felt. On vaginal examination a granulating surface the size of a sixpence was to be seen at the top of the vagina, looking quite healthy. The patient went home on March 16, 1897.

I have seen her several times since, the last time on February 26, 1904, seven years after the operation, at the London Hospital, when I also examined her. There was no sign of recurrence.

It is important to notice that these cases are very rare, and that they are at first liable to be regarded as cases of subinvolution, with metrorrhagia.

Floodings, with more or less persistent metrorrhagia, with fever, and an offensive vaginal discharge, are the chief symptoms. When a woman has a flooding, and passes large clots, she naturally is apt to think she has had a miscarriage.

I had a typical case of chorion-epithelioma following a miscarriage under my care in the London Hospital in the summer of 1902. The nature of the case was not recognised till secondary deposits were found in the vagina. Nothing in the way of operative treatment was attempted, and the case ran a rapidly fatal course.

CHAPTER XIII.

DISEASES OF THE FALLOPIAN TUBES.

Congenital peculiarities.—The chief one is the existence of two or more openings surrounded by fimbriæ, two or more accessory fimbriated extremities, instead of one. In the hundred specimens I examined, this condition was met with six times; in most of these, but not in all, the accessory opening communicated with the main tube.

Inflammation of the Fallopian tubes.—Salpingitis.—This is an extremely important affection, as proved both by post-mortem room investigation and by clinical observation. For example, in cases of pelvic peritonitis following labour, it is certain that in most, perhaps in all, cases, the sequence of events is—endometritis, salpingitis, and extension of the inflammation from the tube through the open fimbriated extremity, producing pelvic peritonitis. If the patient recovers, we cannot prove the existence of the salpingitis; but if she dies, we may actually see it, as I remember doing in a case of puerperal fever, fatal a short time after delivery. There was evidence, post-mortem, of corporeal endometritis; the fimbriated ends of the tubes were open, pus could be pressed out of them, and patches of lymph were seen distributed over the pelvic peritoneum generally. In this case it is to be noted that the fimbriated ends of the tubes were open. This must have been because the inflammation of the pelvic peritoneum immediately external to the fimbriated extremity of the tube was of too intense a character to allow of the formation of adhesive lymph in the neighbourhood of the opening of the tube, which would have sealed it up.

In less acute and chronic cases the fimbriated opening has generally become obliterated by adhesive pelvic peritonitis gluing it to surrounding parts. Had this occurred in the case

mentioned, the inflammation might have remained localized, and the patient have recovered.

Etiology and morbid anatomy.—From what has been said, it will be evident that the etiology of salpingitis is to a great extent, if not entirely, that of corporeal endometritis—that is to say, the essential cause is infection. The

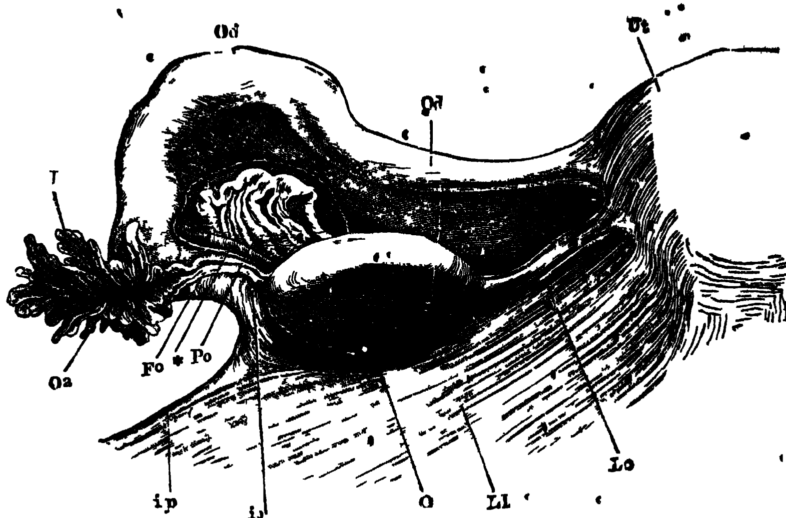


FIG 190—UTERUS WITH THE APPENDAGES OF THE LEFT SIDE SEEN FROM BEHIND (Henle).

Ut. Uterus Od The inner narrower part of the Fallopian tube, called the *isthmus* Od The outer wider part, called the *ampulla* J The fimbriated extremity of the tube The fimbriæ surround Oa, the abdominal orifice of the tube Fo The ovarian fimbria attached to the outer end of the ovary, O. Lo Ovarian ligament Po Parovarium Ll Part of the broad ligament. "The broad ligaments are formed on each side by a fold or double layer of the peritoneum, which is directed laterally outwards from the anterior and posterior surfaces of the uterus to be connected with the sides of the pelvic cavity" (Quain) The peritoneum covers the anterior surface of the uterus as low as the level of the internal os, it covers almost the whole of the posterior surface, and extends on to the upper fifth of the vagina ip. The infundibulo pelvic ligament, *i e* that part of the upper free border of the broad ligament not occupied by the Fallopian tube, it runs outwards to the brim of the pelvis

organisms concerned in producing endometritis may thus by an ascending infection also cause salpingitis: a list of the chief organisms in question is given on p. 365.

Occasionally infection of the tubes resulting in salpingitis

may arise otherwise than by an ascending infection. The organisms may come from the blood stream, as, for instance, may be the case in tubercular salpingitis, and in certain fevers; or sometimes infection may come from the bowel when this has become adherent to the tube.

Clinically salpingitis may arise after labour or abortion, as a complication of gonorrhœa, or it may arise after intra-uterine manipulations or operations not conducted aseptically.



FIG. 191 UTERUS AND ITS APPENDAGES, SHOWING THE STATE OF THE LATTER WHEN MATTED TOGETHER BY THE ADHESIONS RESULTING FROM PELVIC PERITONITIS

The ovaries are not visible, being concealed by the adhesions. During life, the physical signs would be, diminished mobility of the uterus, and the presence of "thickening" at the sides of the uterus As the fimbriated extremities of both tubes are sealed up, a patient whose organs are in the condition represented is sterile (Heitzmann)

When the inflammation has reached the fimbriated extremity of the tube, pelvic peritonitis is set up in its neighbourhood. Provided the pelvic peritonitis be of the adhesive variety, what happens is, that the fimbriated end of the tube is closed up, being as it were glued to the ovary, and all trace of the fimbriæ is usually lost.

Subsequently the tube may become dilated by accumula-

tion of the inflammatory secretion. Whether in a particular case dilatation occurs, or not, seems to depend on whether there is free escape for the secretion towards the uterus, or not.

In many cases of dilated tubes, we do find that there is



FIG 192 —DOUBLE HYDRO-SALPINX (Hennig)
a Uterus *b b* Fallopian tubes *c c* Dilated portions of the tubes *d* Part of an adhesion indicating previous pelvic peritonitis. *e e* Ovaries

a communication open towards the uterus—that the canal is not closed in this direction, but in such cases we find the channel of communication very fine and tortuous, so that there is practical occlusion When the channel towards the uterus is narrow, we can easily understand that there is little tendency for the secretion to escape into the uterus; for as

the Fallopian tube becomes dilated, it tends to fall behind the uterus into Douglas' pouch; the escape of the fluid is then hindered, partly by gravity, and partly by the kinking of the channel. The outer two-thirds of the tube is the part most liable to become dilated; the sausage-like swelling formed is largest at its outer part, and the whole swelling is usually more or less distinctly sub-divided by annular constrictions into two or three compartments, which, however, communicate freely with one another.

Dilated tubes are classified as either *hydrosalpinx*, *pyosalpinx*, or *hæmatosalpinx*, according to the nature of their contents.

In hydrosalpinx the fluid is usually clear and yellow; occasionally it is milky. So long as the contents are not distinctly purulent, and are not composed of blood, it is best to classify a specimen as one of hydrosalpinx.

In pyosalpinx the dilated tube contains pus.

In hæmatosalpinx the tube contains blood.

Frequency.—I examined the condition of the pelvic organs with special reference to this question in a series of a hundred bodies taken as consecutively as possible in the post-mortem room of the London Hospital; *dilatation of the Fallopian tubes was found in seventeen of these cases.*

In 5 cases there was pyosalpinx.
In 8 „ „ hydrosalpinx alone.
In 4 „ „ hæmatosalpinx.

There was evidence of pelvic peritonitis in *all* the cases.

Whatever be the cause of salpingitis, it is a cause which tends to affect *both* tubes. In thirteen out of the seventeen cases both tubes were dilated; and of the remaining four (where there was dilatation only on one side), in two only was the Fallopian tube on the undilated side normal; taking as the essential characters of a normal Fallopian tube the presence of an open fimbriated extremity, and of a channel in communication with the cavity of the uterus.

Relation of hydrosalpinx to pyosalpinx.—These conditions are probably merely stages of the same disease; the fact that in some cases we find that on one side there is a hydrosalpinx and on the other a pyosalpinx favours this view.

Relation of hæmatosalpinx to hydro- and pyosalpinx.—Hæmatosalpinx may be produced by hæmorrhage into a tube, the fimbriated extremity of which has been previously

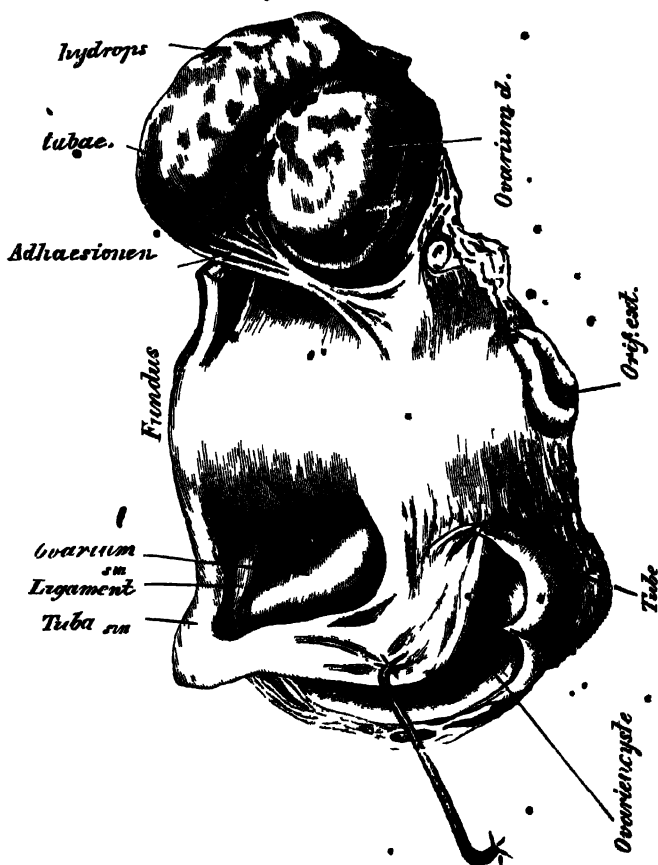


FIG 193—DOUBLE HYDROSALPINX WITH BROAD ADHESIONS BETWEEN THE DILATED TUBES AND ADJACENT PARTS (Winckel).

The uterus and its appendages are seen from behind On the left side there is a small ovarian cyst as well as a dilated Fallopian tube. *Tuba sin.* Left tube *Ovarium sin* Left ovary *Ovariencyste.* Ovarian cyst. *Adhaesionen.* Adhesion. *hydrops tubae* Dropsy of the tube *Ovarium d* Right ovary.

obliterated, or by an accidental hæmorrhage into a pre-existing hydro- or pyosalpinx.

In many cases, however, hæmatosalpinx is the result of

extra-uterine pregnancy occurring in the Fallopian tube. In other words, in some cases hæmatosalpinx is due to the presence of a blighted ovum, successive hæmorrhages into the tube taking place from time to time, similar to the hæmorrhages that accompany pathological conditions of the ovum when the pregnancy is intra-uterine. In some specimens of hæmatosalpinx, due to extra-uterine pregnancy, the fimbriated extremity of the tube remains patent—a fact which is in keeping with the pathology of the condition just mentioned.

It is well to bear in mind, then, that what appears to be merely a hæmatosalpinx may really be a blighted ovum—in fact, a tubal mole—in the Fallopian tube. This may be proved by finding chorionic villi in sections of the mass examined under the microscope.

Hæmatosalpinx may also be produced by backward dilatation of the genital passages in cases where there is a physical obstruction to the escape of the menstrual fluid. In long-standing cases, after the vagina has become dilated, the uterine cavity becomes dilated (hæmatometra), and subsequently the tubes on each side become dilated also. For a case of this see p. 97.

Importance to be attached to these conditions.—As to the facts, in the writer's series, in one case certainly, and probably in another, the dilated tubes were the cause of death.

Both these were cases of pyosalpinx, and the patients died of acute peritonitis. In one of them the place where the wall of the dilated tube had given way, allowing its contents to escape into the peritoneal cavity, was clearly seen.

In one case, that of a woman, aged sixty-two, the tubes contained cheesy masses; this probably should be classified as a case of pyosalpinx that had undergone natural cure.

The condition of a patient who is the subject of a pyosalpinx is certainly a serious one. The diagnosis of pyosalpinx from hydro- or hæmatosalpinx is often practically impossible. The presence of more or less severe fever from time to time would be in favour of pyosalpinx; but there may be sometimes high fever where there is only hydrosalpinx. Again,

patients with even double pyosalpinx, the pus being horribly fœtid, may have long periods of quiescence—periods in which they are free from fever, and perhaps from pain.

Diagnosis. — *Symptoms.* — These are not always very definite; but a case presenting the following group of symptoms may, with a good deal of probability, be set down as one of dilated Fallopian tubes.

The patient complains of pain across the lower part of the abdomen, and it may, or may not, be worse on one side. She has dysmenorrhœa, and the regularity of the catamenia

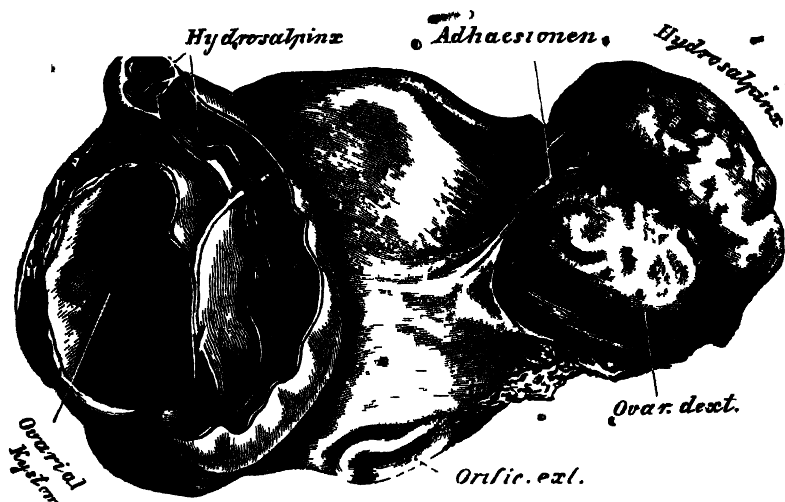


FIG. 194.—DOUBLE HYDROSALPINX (the same specimen as in the preceding figure—Winckel)

Showing the communication between the ovarian cyst on the left side and the dilated tube. This condition is called "a tubo ovarian cyst"

is not infrequently disturbed. Menorrhagia, and sometimes metrorrhagia, are commonly met with in these cases. If the dysmenorrhœa dates from a particular confinement or abortion, or if a history of gonorrhœa can be obtained, the probability of the tubes being diseased is strengthened. Again, the history that the patient has had several previous attacks of pelvic peritonitis is strongly suggestive of disease of the Fallopian tubes. Such cases have been termed cases of "recurrent peritonitis." Patients themselves often speak of pelvic peritonitis as "inflammation of the bowels." A

history of attacks of "recurrent peritonitis," or of several attacks of "inflammation of the bowels," particularly in a woman who is absolutely sterile, or has been so during the time covered by the history of these attacks, points strongly to chronic salpingitis.

Physical signs.—In some cases where the swelling formed by the dilated tube is very small, particularly if the part of the tube affected is that just external to the uterus, it may be impossible to recognise any swelling. Such a case is, however, exceptional; dilatation usually affects the outer part of the tube, leaving a portion of undilated tube between the uterus and the tumour. Again, in most cases, both tubes are dilated, and in all cases there is pelvic peritonitis, varying in extent. It has been mentioned that the tumour formed by a dilated tube tends to fall behind the uterus; still, however, keeping rather to its own side of the middle line.

Given the history such as that sketched out above, if we find the uterus less movable than normal (on account of the accompanying pelvic peritonitis), and if we find a sausage-like tumour lying in Douglas' pouch, a little to one side of the middle line, that feels as if it contained fluid, and is partially fixed, still more if this condition exists on both sides, the probability is that the case is one of dilated tubes.

Considering the frequency of dilated tubes among the general population, as evidenced by the frequency they were met with in a consecutive series of bodies, coming from all parts of a general hospital (in my series, 17 per cent.), it is, I think, a fair inference that, if it were possible to examine the organs in a series of patients *attending the gynæcological department in any of our hospitals*, we should find the percentage of cases in which the tubes were diseased larger still. For instance, where there is lessened mobility of the uterus, with the presence of either a distinct lump, more or less fixed, in one or both posterior quarters of the pelvis, or even where there is "thickening" such as is usually taken as evidence of a previous pelvic inflammation—peri- or parametritis—such cases would, I think, if it were possible to examine the organs, yield a high percentage of dilated tubes (see Fig. 191). In cases where these physical signs are present, and where

the abdomen has been opened, it is usually, if not invariably, found that the tubes are diseased.

Except in a very few cases when the tubes are inflamed and dilated, the ovaries are involved in the inflammatory process. Occasionally, where the tube is dilated, it may remain free from the ovary. For instance, I had a case where the dilated tube had its pedicle (undilated inner portion) actually twisted, with symptoms similar to those

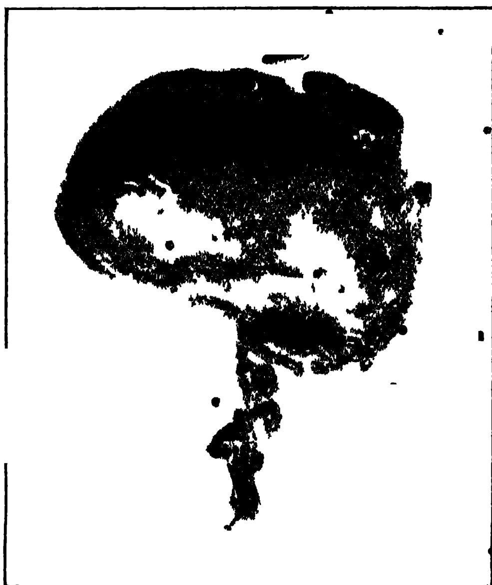


FIG. 195.—PYOSALPINX WITH TWISTED PEDICLE.

Acute symptoms like those in cases of ovarian tumour with twisted pedicle. The case is fully recorded in *Trans. Obst. Soc. Lond.*, vol. xliv., p. 362. The corresponding ovary was free from the pyosalpinx, and was not removed.

found when the pedicle of an ovarian cyst becomes twisted. In this case it was possible to remove the dilated tube without removing the ovary. (Fig. 195.)

Treatment.—When symptoms are present and the physical signs are well marked, the proper treatment is abdominal section, with removal of the diseased appendages—salpingo-oophorectomy. In performing the operation the uterine end of the tube should not be included in the ligature securing

the main pedicle. It should be dissected out of the uterine cornu for the depth of half an inch or so, and the cut surfaces of uterine tissue should be united with silkworm-gut sutures.

As a rule, if possible, it is better not to operate during an acute febrile exacerbation, but to wait for a quiescent interval. It is the fact that after a time the pus in a pyosalpinx tends to become sterile, and so the risk of the operation is very much lessened.

In the large majority of cases in which I have sent pus from a pyosalpinx for bacteriological examination the report has been that the pus was sterile

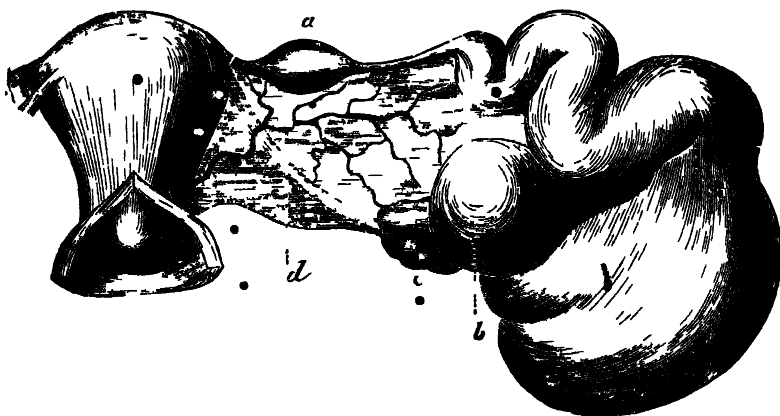


FIG. 196—DILATED FALLOPIAN TUBE (Boivin et Dugès).

The outer part of the tube is chiefly affected; there is a second smaller dilatation at *a* near the uterus.

It is a little difficult to believe when the operation for removal of the pyosalpinx has followed an acute exacerbation of symptoms (rigor, T. 104°, pulse 140) only a week afterwards that the word "sterile" as applied to the pus is to be regarded as equivalent to "innocuous" Possibly some toxic products capable of causing such symptoms as those just mentioned may exist, even though the organisms in the pus are dead.

The exact nature of the operation must of course be explained to the patient, and, if she is married, to her husband.

The proportion of cases in which the removal of the appendages is found to be impossible diminishes greatly as the experience of the operator increases. There are very few cases indeed in which an experienced operator finds it impossible to complete the operation.

As regards the possibility of completely removing the diseased parts in the series of seventeen (post-mortem) specimens referred to above, in one case a complete operation during life would have been impossible. In another case a



FIG. 197.*—Showing the appendages grasped by large elbowed pressure forceps. The pedicle-needle, bearing a loop of silk, perforates the broad ligament below the forceps and near the uterus (Doran).

The ligature is then to be adjusted ready for tying, and the appendages are seized with two pairs of small Wells' forceps just above the large pressure forceps, this is removed, and the ligature tied, the appendages are then cut away The small forceps are merely to retain a hold of the pedicle, to allow of its being inspected just before the closing of the abdominal wound.

complete operation would have been possible, provided the body of the uterus were removed at the same time. As regards the remaining fifteen specimens, a complete operation would have been possible in all, and easy in most.

It is probable that salpingitis due to tubercle is more common than is generally supposed. In many cases where

* This figure illustrates the method formerly in use. It must now be modified so as to admit of the proximal portion of the tube being completely removed, and not tied in with the main pedicle.

the appendages are removed for chronic inflammatory mischief, microscopical examination of the tubes will discover evidence of tubercular inflammation, and this quite apart from any naked-eye appearances suggesting tubercle, and apart from any general tubercular peritonitis.



FIG. 198.—PRIMARY TUBERCULOSIS OF THE FALLOPIAN TUBES. (*Microphotograph.*)

The epithelium lining the plicæ is swollen, and has lost its typical high columnar character. In the centre several plicæ have fused together, and contain two giant-celled systems. Under a low power about half a dozen giant cells can be seen in every field of the microscope.

Clinical note.—Patient aged 32, married, no children, or miscarriages. Ten years history of chronic inflammation in the pelvis. Both sets of uterine appendages removed by abdominal section. Good recovery.

There are certain very rare diseases of the Fallopian tube, which merely require mention.

Thus the tube may be the seat of a *Primary carcinoma*, or of a *Papilloma*, which is probably semi-malignant.

Also a *Fibroid tumour* may grow in the wall of a Fallopian tube. The exact nature of such conditions cannot be ascertained prior to operation.

ABNORMAL PATENCY OF THE INNER END OF THE FALLOPIAN TUBE.

As a rule, the inner part of the Fallopian tube is so narrow that an extremely fine bristle is needed, and some expenditure of time and patience, to pass it from the uterus along the tube. This is the rule in dead bodies. Very rarely a specimen may be met with where the inner end of the tube is much more open than this, and may allow a common surgical probe to pass along it, even post-mortem, as in a case narrated by the late Dr. Matthews Duncan, where, during life, there was reason to think the sound had passed along the Fallopian tube. During life the inner part of the tube has probably not an unvarying calibre, but may dilate to some extent, perhaps sufficiently to allow an ordinary uterine sound to pass along the tube. It is in this way that cases are explained where the size of the uterus, as ascertained by bimanual examination, is not increased, and yet the sound can be passed several inches in the direction of one of the tubes. In rare cases this may be the true explanation; but in most cases where it happens it is far more probable that the sound has perforated the wall of the uterus, and passed along *under* the peritoneum between the layers of the broad ligament, and is not in the tube at all. Out of the body I have several times tried pressing the point of an ordinary uterine sound against the uterine end of the tube in the direction of the tube. What happens is, that when the pressure has reached a certain intensity, the sound perforates the mucous and muscular coats of the uterus, and slips into the space between the layers of the peritoneum forming the broad ligament, outside the Fallopian tube altogether. The peritoneum is loose in this situation; and unless the sound is pressed with great force, or passed for an extreme distance, the peritoneum is not perforated.

To illustrate some of the clinical aspects of cases of dilated Fallopian tubes, notes of four such cases follow :—

Hydrosalpinx on Left Side. Severe Pain in Left Iliac Region and Metrorrhagia of Five Months' Duration. Removal of Dilated Tube, followed by Complete Relief.

E. F., aged 30, was admitted into the London Hospital under my care on December 18, 1895. She was sent to me by Dr. Rhodes, of Plumstead. She had been married ten years, and had had no children, but two miscarriages at about the second and third month of pregnancy, the last one being nearly two years ago. She complained that for the last five months she had had severe pain, more especially in the left iliac region, but also in the lower part of the abdomen generally, and in the lower part of the back. For the last month she had experienced a sensation of movements in the abdomen. For the last five months there had also been a slightly bloodstained vaginal discharge, practically continuous for the whole of that time. Before five months ago she had been quite regular, but during the last five months she had not been able to tell, on account of the continuous red discharge, when she was menstruating and when she was not. During the same time she had had pain and nausea after food. She often vomited, and this gave relief. She had a perforation of the soft palate: this occurred ten years ago, at a time when she suffered from severe ulceration in the throat. She gave no history of any rash or sore, and there were no other signs of syphilis.

On examination (December 28, 1895) the uterus was found to be of the ordinary size, in the normal position, and fairly movable An elastic, somewhat sausage-shaped swelling was felt in the left posterior quarter of the pelvis; it seemed about the size of a duck's egg, and was fairly movable. The breasts showed no signs of activity. The diagnosis come to was that the swelling was probably a dilated Fallopian tube, or perhaps a small ovarian cyst. The possibility of extra-uterine fœtation was thought of, but excluded on account of there being no sympathetic changes in the breasts, and no enlargement of the uterus.

On January 10, 1896, the patient was anæsthetized with the A.C.E. mixture, and the abdomen opened in the usual way. The swelling above described was found to be the left Fallopian tube dilated, and containing clear watery fluid There was nothing to be seen of the fimbriated extremity of the tube, the outer end being firmly adherent to the corresponding ovary. Only one adhesion had to be tied. The left broad ligament was then transfixed and tied in two halves, one separate ligature being also tied round the whole pedicle. The dilated tube, with a portion of the left ovary, was then removed, and the wound was closed completely. Nothing was done to the appendages on the right side, as they seemed healthy. The patient made a satisfactory recovery. She came up to the Hospital on February 20, and said that she had been completely free from pain since the operation. There had been no return of the metrorrhagia.

Remarks.—An interesting point in the case was the definite and simple nature of the symptoms—pain in the left iliac region, and a persistent metrorrhagia for five months before the operation. It so often happens,

in cases of disease of the appendages, that symptoms are extremely vague, and are not rarely complicated by an obviously neurotic temperament in the patient. This was not so in the present case; the patient was a very sensible woman, having two distinct sources of complaint—the pain and the metrorrhagia; and the removal of the apparent cause has been followed by complete relief from the symptoms. I think persistent pain is a more constant symptom in cases of dilated tubes than is the metrorrhagia, though the latter, is by no means uncommon. In my experience metrorrhagia is also present in a considerable proportion of cases in which the cause of the dilatation of the Fallopian tube is the presence of an early extra-uterine pregnancy.

Left Pyosalpinx. Right Hæmatosalpinx and Small Ovarian Cyst.

O. A , a married woman, 39 years of age, was admitted into the London Hospital under my care on October 26, 1896.

Previous history.—She married at the age of 20, and had a premature confinement about a year afterwards. The child was born alive, but died in half an hour. This was the only pregnancy.

When she was 19 she had a sore on the inner aspect of the left labium. It was burnt with "caustic", about two months afterwards she had an ulcerated sore throat. She is positive that she never had a rash.

Two years after the confinement she had an attack of gonorrhœa, attended with frequent micturition and scalding.

She had scarlet fever at the age of 23, and had had several attacks of "rheumatism."

She had had three separate attacks of "inflammation of the bowels," at the ages of 29, 34, and 39 respectively.

Menstruation began at the age of 14. She was quite regular, and had never lost much at her periods

Present illness.—This began in June, 1896, with an attack believed to be "rheumatic fever" She then went to St Thomas' Hospital. When she had been in the hospital three weeks the abdomen became very tender, especially on the left side. The question of operation was then apparently discussed, but she was not thought at the time to be strong enough to undergo it The pain referred to the left iliac region had persisted up to the present time. She also complained of a constant bearing-down pain, and of some swelling of the right leg.

She was quite regular up to Christmas, 1895; the periods then began to diminish in quantity, and finally ceased in May. There had been two scanty periods since then—one a month ago, and one two days before her admission to the London Hospital.

State on admission.—She is a well-nourished, strong-looking woman. The pupils are unequal and irregular, the right pupil almost the size of a pinhole. They react to light and accommodation. Pulse 102, and temperature 99°.

No cardiac murmur was heard; the urine was normal.

October 31.—As regards the state of the pelvic organs, she was examined under an anæsthetic, and the following note was made:—

"On examination of the abdomen a swelling is felt in the hypogastric region. On vaginal examination a swelling is felt somewhat to the right of the middle line, which is found to be the body of the uterus moderately enlarged. The sound passes 3½ inches. To the left of the uterus there is a swelling the size of an orange, feeling soft and elastic. Both the uterus and this swelling have a fair degree of mobility. The outline of the uterus is fairly regular.

Operation, November 19, 1896.—The patient was anæsthetized with the A.C.E. mixture, and the abdomen was opened by the usual median incision. The tumour to the left of the uterus was found to be a pyosalpinx adherent to the corresponding ovary, and also adherent to the uterus, rectum, and the pelvic wall. The adhesions were separated with the finger, and the dilated tube, with the ovary, was removed, the pedicle being tied in three sections. While pulling up the pyosalpinx the tube burst and pus escaped. It was mopped up as completely as possible with Gamgee pads. On the right side the Fallopian tube was also dilated, its contents being bloody fluid; and the right ovary was also enlarged, so as to form a small cyst containing similar blood-stained fluid. The appendages on the right side were also removed. The patient was put in Trendelenberg's position for a short time, so that the deeper part of the pelvis, from which the adhesions had been separated, could be looked at. She was then put down flat again, and the peritoneum was washed out with saline fluid. An iodoform gauze drain about 30 inches long (it was measured after removal) was put in, and the rest of the wound closed with silk sutures. The gauze drain was removed on the fourth day, and her subsequent progress was uneventful. She went out on January 2, 1897.

The following case illustrates very well the impossibility of exact diagnosis as between a dilated tube and a small ovarian cyst. Both tubes were dilated and contained pus, and there was an ovarian cyst also on each side. On the left side the ovarian cyst itself contained pus.

Mrs. G. was seen in consultation with Dr. Piercy Fox, of Clapham, on January 9, 1897. She was 30 years of age, and had been married twelve years. She had had four children, the last four and a half years ago. She was inclined to think there had been one miscarriage eighteen months ago, as she had then gone ten weeks without "seeing anything"; then bleeding came on, but no lump was passed. After that she was fairly regular, the periods lasting a week, and not much being lost. She had no special pains at the times, except backache.

History of present illness.—She had not been well for several months before I saw her. In the summer of 1896 she fell when getting out of a bus, and from that time she had experienced pain in the left groin. Soon

after this fall she was unable to hold her water for three days, but this trouble soon passed away. About three months before I saw her she caught a chill; she was menstruating at the time. That period only lasted three days instead of a week, and she had practically been in bed ever since, with constant pain in the left iliac region, running down the thigh to the knee. About the time that she caught the chill her temperature was taken, and was found to be 103·5°. She had violent pains in the abdomen, which was very tender, and she vomited after everything she took. The pain was constant for about seven weeks from the beginning of the illness. She had been regular up to the time when she caught the chill. She missed two periods after the chill. About three weeks before Christmas, 1896, she was seen by another consulting physician, after which the pain was also felt in the right iliac region: but for about two weeks before Christmas all her pain had very much diminished, and she got up the day after Christmas. Her pains, however, came on more acutely than before, causing her to go back to bed, and pain in the lower abdomen had been constantly present, especially in the left iliac region, up till the time when I saw her (January 9, 1897) As already mentioned, she missed two periods after the chill, but soon after the consultation, three weeks before Christmas, the period came on again, and lasted for a fortnight.

At the time I saw her the temperature was 101°. The lower abdomen was tender, and an indistinct swelling could be felt in the hypogastric and left iliac regions. On vaginal examination the uterus was fixed, and fixed swellings could be felt in the right and left posterior quarters of the pelvis. The swelling in the left was distinctly elastic, and I felt sure that it contained fluid. Taking into consideration the long period during which she had been ill (over three months), the fact that she had been feverish on and off during the whole of that time, and the persistence of the pain for the same period, I came to the conclusion that the case was either one of suppurating ovarian cyst, or pyosalpinx, possibly bilateral, with a good deal of pelvic peritonitis round the tumour or tumours. I advised that an exploratory abdominal section should be performed, and the swellings removed, if the opinion as to their nature which I had formed was correct.

Operation, January 14, 1897 —The patient was anæsthetized with the A.C.E. mixture. Dr. Piercy Fox gave the anæsthetic, and I was assisted at the operation by Dr. L. A. Smith, who was at the time Resident Accoucheur at the London Hospital. On opening the abdomen in the usual way, the swelling to the right of the uterus at once came into notice. The swelling was made up of an ovarian cyst the size of a Tangerine orange, containing a thin brownish-red fluid, and of the right Fallopian tube, which was enlarged so as to be as thick as the thumb. Its fimbriated extremity could not be distinguished either at the operation or subsequently. The right Fallopian tube contained pus. Both the right ovarian cyst and the right Fallopian tube were very extensively adherent in the pelvis. The attachments were ultimately separated, during which both the cyst and tube burst, and the pedicle was transfixed and tied with

silk as usual. The swelling to the left side, which had been the more conspicuous one before the operation, consisted of the left Fallopian tube thickened to the size of the thumb, intimately adherent to the left ovary, which had become cystic and reached the size of an ordinary orange. The Fallopian tube was intimately adherent to the ovarian cyst, and they both contained pus, which escaped during the separation of the adhesions in the pelvis, which, as on the other side, were extremely extensive and firm. A fairly satisfactory pedicle was ultimately established on the left side, and tied: The left appendages were then removed. The peritoneum was washed out with hot saline solution, and a long strip of iodoform gauze, a yard or more, in one continuous piece, was packed into the pelvis, one inch of the gauze being left projecting at the lower angle of the wound. The rest of the wound was closed in the usual way, and the patient put back to bed. During the first two days after the operation she appeared to be in a very critical state, the pulse being exceedingly weak, although not excessively rapid; 112 to 120 indicated the range of frequency. Several hypodermic injections of strychnine were given, which improved the pulse considerably. She was fed by nutrient enemata. On the 16th there was a decided improvement in the pulse, and the improvement was maintained on the 17th, when the iodoform gauze was removed. I felt fairly certain on that day, that, apart from accidents, the case was going to do well. A small piece of gauze was passed down for some two or three inches, just to keep the cavity from which the gauze plug had been removed properly drained.

There is little more to say about the case. The highest temperature from the 14th to the 26th was 100°, after which it was normal, and she ultimately made a very satisfactory recovery.

The following case was one of uterine fibroid, complicated by a small suppurating ovarian cyst on the left side. The uterine appendages were removed on both sides, but the fibroid was left. The date of this case is 1897. With a similar condition now I should certainly do an abdominal hysterectomy for the fibroid in addition to removing the ovarian cyst and dilated tube.

A. L., a single woman, employed as a florist, aged 37, was admitted into the London Hospital under my care on January 11, 1897, at the request of Dr. Deane, of Leytonstone.

Previous history.—She had always enjoyed good health until the present trouble began about a month ago.

Menstruation.—She began to menstruate at 14, and had been regular every four weeks till the beginning of the present illness. She had very little pain at the periods, and the quantity lost at each period had been moderate up till two years ago, since which time up till November, 1896, it had been relatively excessive. Since then there had been a more or less constant sanious discharge.

Present illness.—The present trouble began about November, 1896, when she noticed a swelling of both legs, principally the left, and aching of the legs. Both these conditions were relieved by lying down. During the same time she had complained of pain in the lower part of the abdomen—chiefly on the left side—of a dull aching character, somewhat relieved by lying down. This pain had been in the left iliac region, never above the umbilicus. She had also complained since the beginning of the illness of night sweats. She was apparently quite well till about Christmas, 1895, and, except for a feeling of general malaise, she noticed nothing particularly wrong until about November, 1896, when the legs began to swell, as already mentioned. The catamenia were quite regular up till November, 1896, every four weeks, but since then she had been losing blood on and off.

State on admission, January 11, 1897.—The patient is sallow-looking, somewhat anæmic and thin, with no indication of anything wrong with the heart and lungs. The urine was normal.

Abdominal examination.—A swelling is felt in the hypogastric and left iliac regions, reaching up about half-way between the umbilicus and pubes, and reaching outwards on the left side within two inches of the anterior superior iliac spine. The surface of the swelling is somewhat irregular. The swelling extends very slightly also to the right of the middle line.

Vaginal examination.—The nymphæ are large and pendulous. On bimanual examination the swelling in the middle line is apparently the body of the uterus considerably enlarged, and a good deal less movable than it should be. There is also a swelling in the left posterior quarter of the pelvis, which suggests the presence of inflammatory mischief affecting the left uterine appendages. This swelling is more or less fixed. The right lateral fornix appears normal. The sound passes with some difficulty $3\frac{1}{8}$ inches.

The diagnosis made was uterine fibroid, with inflammatory mischief of the left uterine appendages, probably purulent.

The patient was in the Hospital for twenty-four days before the operation. During that time she had a feverish attack lasting about five days, the temperature reaching 101°. She was carefully examined again on February 1, 1897, when the physical signs were just the same as those already noted.

Operation, February 4, 1897.—The patient was anæsthetized with the A.C.E. mixture. The abdomen was opened in the usual way. It was then found that there was a large fibroid tumour of the uterus, and also a tumour outside the uterus in the region of the left uterine appendages. On further examination this swelling was found to be composed of an ovarian cyst the size of a large orange, and the left Fallopian tube, which was enlarged so as to be as thick as the thumb. No sign of the fimbriated end of the tube could be seen, the tube simply ending on the cyst. The ovarian cyst was intimately adherent for an inch or more to the sigmoid flexure, and there were also adhesions between the cyst and the pelvic wall. During the separation of these deep adhesions the cyst burst, and

its contents, which were purulent, escaped, some of the pus going into the peritoneum. The ovarian cyst and the dilated tube on the left side were ultimately freed and drawn up out of the wound, the pedicle transfixed and tied with two interlocking ligatures, and a single silk ligature tied round the whole pedicle. The cyst and dilated tube were then removed The right uterine appendages were healthy, but they were removed in a similar manner, with a view of influencing the fibroid tumour of the uterus. (The patient had given her consent to allow either the removal of the uterus with the fibroid tumour, or the removal of the uterine appendages, whichever should seem in the course of the operation to be the more desirable.) The peritoneal cavity was then washed out with warm salt solution, and an iodoform gauze drain was packed into Douglas' pouch, one end of it being left out at the lower end of the incision. The rest of the wound was then closed in the usual way. The gauze was removed on the fourth day after the operation, and the patient made an uneventful recovery, leaving the Hospital on March 6, 1897 Her temperature after the operation never exceeded 100.6°. It remained in the neighbourhood of 100° to about the end of the fourth day, after which it was practically normal.

I have seen her several times since she left the Hospital. There has been no return of the menstrual periods, and she has been free from pain.

CHAPTER XIV.

PELVIC INFLAMMATION (PELVIC PERITONITIS, PELVIC CELLULITIS).

THE expression "pelvic inflammation" includes pelvic peritonitis and pelvic cellulitis; for though in a particular case we are usually able to say it is a case of pelvic peritonitis, or a case of pelvic cellulitis, according to circumstances, they are usually present together, the one, however, predominating over the other, and giving its name to the case.

Pelvic peritonitis is also known as *perimetritis*, and pelvic cellulitis as *parametritis*.

PELVIC PERITONITIS—PERIMETRITIS.

Etiology.—Cases of pelvic peritonitis can always be placed in one of the following groups:—

1. Cases starting from *labour* and *abortion*.
2. Cases arising in connection with *menstruation*.
3. Cases following *gonorrhœa*.
4. Cases due to *traumatic causes*, the injury permitting the entry of septic matter, *e.g*, rough use of the sound, etc.
5. There remain some cases of pelvic peritonitis which do not belong to any of the above groups; such are:—

Cases of pelvic peritonitis arising in connection with:—

a. Ovarian tumours.

b. Fibroid tumours.

c. Malignant disease and tubercle.

It will be seen that the etiology of pelvic peritonitis, as regards the first four groups of cases, is identical with the etiology of corporeal endometritis—that is to say, the essential exciting cause is infection by micro-organisms; and

indeed, in these four groups, with the doubtful exception of the cases arising in connection with menstruation, there is no doubt that the pelvic peritonitis generally arises by extension of the inflammation from the body of the uterus along the tubes to the peritoneum, the sequence being corporeal endometritis—salpingitis—pelvic peritonitis.

The chief micro-organisms concerned in the production of pelvic inflammation are: Streptococci, staphylococci, gonococci, the bacillus coli communis, pneumococci, and the bacillus of tubercle.

As regards the group of cases arising in connection with menstruation.—Clinically there is no doubt that pelvic peritonitis very commonly follows exposure to cold or over-exertion at the menstrual periods. In the present state of pathology exposure to cold can only be regarded as a predisposing factor diminishing the resistance of the individual, and so rendering the conditions favourable for the development of a micro-organism. As the menstrual blood diminishes or destroys the acidity of the vaginal secretion, the condition during menstruation will be more favourable for the development of pathogenic organisms, which may then happen to gain access to the vagina, than at other times.

It should be remembered that at the menstrual periods the whole of the pelvic viscera are congested physiologically, and it is easy to see that there should be at that time a special predisposition to pelvic peritonitis, and at the same time to an inflammation of the whole mucous tract of the genital organs, *i.e.*, salpingitis, corporeal endometritis, cervical endometritis, vaginitis.

Morbid anatomy.—Pelvic peritonitis may be either :—

1. *Simple.*—Here the peritoneum is injected, and the surface has lost its lustre, but there is no perceptible exudation of lymph upon it.

2. *Adhesive.*—Here there is a layer of lymph exuded on the surface of the inflamed peritoneum. Such a layer is commonly as thick as a piece of stout blotting-paper.

3. *Serous.*—This is similar to the last variety, except that the lymph-covered surfaces are separated by serous fluid to a variable extent. Often the serous fluid accumulates within the substance of adhesions, the result being the formation of

a pseudo-cyst. Such pseudo-cysts may be found of any size from that of an orange downwards.

4. *Purulent.*—In this variety the fluid separating the inflamed peritoneal surfaces is pus.

In serous perimetritis and purulent perimetritis, the fluid is encysted, its boundaries being formed partly perhaps by some natural boundary, *e.g.*, Douglas' pouch, and elsewhere by adhesive peritonitis between the neighbouring coils of intestine and other adjacent organs, shutting off the fluid from the general peritoneal cavity.

In chronic cases with extensive membranous adhesions the fluid in serous peritonitis is often found in isolated collections imprisoned within cavities bounded by the adhesions, as explained above.

It should be noticed that a pelvic abscess may be due to a perimetritis as well as to a parametritis (pelvic cellulitis). Such abscesses due to perimetritis are either actually examples of pyosalpinx, or are collections of pus (localized by adhesions between adjoining viscera) that have been caused by a small escape of pus from an inflamed Fallopian tube, or from a minute rupture of a pyosalpinx.

Symptoms.—*In acute cases* there is pain across the lower part of the abdomen, vomiting, and the ordinary symptoms of fever, anorexia, thirst, headache, and so on; there may be rigors: frequent desire to pass water, and pain in passing it, are common symptoms, and there may be pain on defæcation.

In chronic cases the prominent symptom is pain across the lower part of the abdomen, either right across the abdomen, or more or less localized in one or other iliac region, and backache. Dysmenorrhœa is common in such cases, and there is often sterility.

There is usually disturbance of the regular course of menstruation, either in the direction of amenorrhœa, or of menorrhagia.

Dyspareunia is often present in the chronic form, such as produces adhesions, with more or less fixation of the uterus and uterine appendages.

In cases of adhesive perimetritis arising in connection with ovarian tumours, there is sometimes no pain.

Signs.—*In acute cases.*

General.—There is rapidity of the pulse, and a high temperature. The patient lies on her back with her legs drawn up.

Local.—*The abdomen* is more or less distended, and is very tender on palpation; owing to the rigidity of the muscles, we may not be able to make out much by abdominal examination. In other cases, as soon as sufficient time has elapsed to allow of adhesions forming (say forty-eight hours), we may feel a lump, perhaps reaching up to the umbilicus, or higher; such a lump is fixed, hard, tender, and may be more or less resonant. It is formed by matting together of the intestines by adhesive peritonitis. The omentum is often adherent to the inflamed intestines, and takes a part in forming the kind of lump under consideration.

Vaginal examination.—During the first few hours of the attack we only find great tenderness on examination, and that the vagina is hot; perhaps an indistinct fulness in the posterior fornix may also be detected at this stage.

Later, say after forty-eight hours, when the exudation has had time to coagulate, and the adjacent parts have become fixed by adhesive peritonitis, the physical signs in typical cases are either:—

1. The uterus is fixed, and occupies the centre of the pelvis; all round it we feel hardness, so that, to quote the usual simile, it feels as if plaster of Paris had been poured into the pelvis, and had set.

2. In another equally characteristic condition, we find, as before, the uterus fixed, but pushed forward, so as to lie close to the pubes; as before, there is hardness all round, but behind the hardness takes the form of a definite lump, which has pushed the uterus forwards.

The lump has often rather a sharp edge at its lowest part, running transversely across the pelvis, best defined about the region of Douglas' pouch.

This lump is formed by accumulation of the exudation while still fluid in Douglas' pouch, owing to the action of gravity (Fig. 199)

In chronic cases.—One of the most constant physical signs is *lessened mobility of the uterus*; considerable experience

is necessary to say when the uterus is less movable than it ought to be, when the diminution in mobility is only slight.

It is observed by endeavouring to tilt the uterus as a whole upwards, and noticing whether it moves as much, and as easily, as it does when the parts are healthy.

More or less thickening may be felt at some parts of the vaginal roof, either behind, or in the right or left posterior quarter of the pelvis. It has already been mentioned, in the account of diseases of the Fallopian tubes, that, judging both from post-mortem room experience, and the experience re-

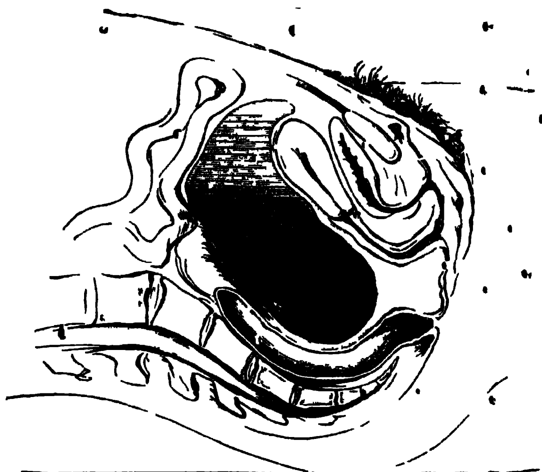


FIG. 199.—SUCCESSIVE ACCUMULATIONS OF LYMPH IN DOUGLAS' POUCH IN PELVIC PERITONITIS, SHOWN IN SECTION (Thorburn).

sulting from abdominal operations, such "thickenings" are in many cases composed of a more or less dilated Fallopian tube matted by adhesions to the ovary, uterus, and parts around. This probability is increased if the thickening is felt in one or other posterior quarter of the pelvis, and is still greater if it occurs in both posterior quarters.

COURSE.

It is said that the inflammatory products may be entirely absorbed, and no doubt this is true of the greater portion of such products in each case; but judging from the frequency

with which adhesions are met with in the post-mortem room and during operations, between the various parts of the pelvic viscera, it is difficult to believe that the inflammatory products, once the adhesion stage has been reached, are ever so entirely absorbed as to leave no trace whatever in the form of adhesions.

When the fimbriated extremities of the Fallopian tubes are closed by adhesive peritonitis, we have necessarily an absolute sterility; and we have the condition established for dilatation of the tubes to occur, according as the secretion in the tube can escape easily through the uterine end of the tube, or not.

In the chapter on dysmenorrhœa it has been suggested how the persistent adhesions after an attack of pelvic peritonitis may have a share in causing painful menstruation.

If the inflammation goes on to suppuration, we have a pelvic abscess; it may burst either externally, or into the vagina, bladder, or bowel.

PROGNOSIS.

Pelvic peritonitis usually ends in convalescence; but from what has been said, it is clear that the patient will be unusually fortunate if she escape some of the common sequelæ of pelvic peritonitis—*chronic pelvic pain*, *dysmenorrhœa*, *dyspareunia*, and *sterility*. Further, relapses are common, particularly from imprudence during menstruation, over-exertion, exposure to cold, and so on.

Certain cases following labour illustrate the tendency of the inflammation to be lighted up again by slight causes. It is not uncommon to see a case where, after labour, nothing of sufficient importance occurred to attract attention till the patient got up, probably about the tenth day, and that then well-marked symptoms and signs of pelvic peritonitis developed. The explanation of such cases is probably that a slight pelvic peritonitis really existed from the first; but so long as the patient remained at rest in bed, the symptoms were ill-marked, pain perhaps being absent, or being taken for after-pains. When she got up, the tendency to congestion accompanying the upright position, and the exertion,

caused the pelvic peritonitis to become more severe, and to be accompanied by definite symptoms. When the inflammation becomes general—when general peritonitis results from pelvic peritonitis—the prognosis is very grave.

DIAGNOSIS.

In acute cases.—The chief conditions from which pelvic peritonitis has to be distinguished are:—

Pelvic cellulitis.
Pelvic hæmatocele.
Extra-uterine fœtation.

In cases both of pelvic cellulitis and pelvic hæmatocele, and in most cases of extra-uterine fœtation, there is pelvic peritonitis as a minor complication, but there are usually sufficient grounds for enabling us to decide which is the predominating condition present

Pelvic cellulitis.—As regards *etiology*, this more often follows wounds of the cervix, by laceration during labour, if septic organisms gain access to the wound.

Symptoms.—Pain, nausea, and vomiting are less marked. The patient lies with only one leg drawn up

Physical signs.—In pelvic cellulitis there is usually a lump at one side of the uterus pushing it to the opposite side. The finger feels, *on the unaffected side*, the normal arching of the lateral fornix, while *on the affected side* it comes on a mass bulging downwards, and so producing a convexity in the lateral fornix, instead of the normal concavity Thus the vaginal portion of the cervix appears shortened on the affected side. The uterus and tumour formed by the exudation are less absolutely fixed than in typical cases of pelvic peritonitis

Pelvic hæmatocele.—The history here is the chief point—sudden onset—sudden pain in the pelvis, with a sense of nausea, faintness, and perhaps vomiting. Such conditions are particularly significant if they happen when, a menstrual period having been a week or so overdue, metrorrhagia occurs. It should be remembered that in the large majority of cases pelvic hæmatocele is due to extra-uterine fœtation.

Physical signs.—In intra-peritoneal pelvic hæmatocele, the one we are now considering, the lump in Douglas' pouch is, as a rule, much larger than that formed in simple pelvic peritonitis, and the uterus is pushed farther forwards.

Extra-uterine fœtation.—Many cases of extra-uterine fœtation have in their earlier progress been mistaken for pelvic peritonitis. The history in such cases usually helps us—the patient has probably gone two or three weeks over her proper time without menstruating; and then bleeding comes on again—a decidual cast of the uterus may be passed. A tumour, formed by the sac of an extra-uterine fœtation, is before rupture usually more to the right, or left, of the middle line than the lumps formed by pelvic peritonitis; also before rupture, or tubal abortion, such a lump would be movable.

Again, in extra-uterine fœtation, the temperature is not as a rule much raised above normal, if at all. Exceptions to this rule are, however, sometimes met with.

TREATMENT.

Preventive treatment.—A consideration of the etiology will suggest many precautions for guarding against pelvic peritonitis.

As regards labour and abortion, the utmost care should be taken to avoid introducing septic matter on the examining finger; the nails should be kept short, the greatest care should be taken to cleanse them thoroughly *with a nail brush* before making a vaginal examination; a knife should never be used for this purpose, as one constantly sees done. The point of the knife merely produces a naked-eye appearance of cleanliness, and is utterly useless for producing the absolute cleanliness which is alone efficient. The use of a knife in this way deepens the space under the nail, and increases its capacity of collecting dirty material, while it can only remove the more obvious portion of such material. It may seem unnecessary to dwell upon this apparently small matter, but it is in reality one of great importance. A reliable method for rendering the hands aseptic has been already described (p. 37). Again, over-frequent examinations during labour should be avoided.

Acute vaginitis, gonorrhœal or other, should be cured as soon as possible. In using injections for vaginitis care should be taken to see that there is a free return for the fluid used. I think the hydrostatic douche a much safer apparatus than Higginson's syringe. I have seen three cases where a rigor, and a sudden high temperature, with pain across the lower part of the abdomen, followed soon after the use of a Higginson's syringe in vaginitis; it seems at least possible that some small quantity of the injection mixed with some of the secretion in the vagina may have passed into the peritoneum along the Fallopian tubes. There is obviously much greater danger of this accident happening if an intra-uterine injection is being given; a tube having a double channel should always be used in such cases, and the hydrostatic douche apparatus, not Higginson's syringe. Some air always gets in when douches are given with the latter. This can be shown by using a glass vaginal pipe fitted on to a Higginson's syringe; during the "diastole" of the bulb, air will be seen in the upper inch of the glass tube.

As regards all intra-uterine operations, passing the sound, dilating the cervix, scraping the endometrium, etc., all possible antiseptic precautions should be taken.

Treatment in acute cases.—The patient must be kept at perfect rest in bed, and the treatment must be chiefly symptomatic. If there is *vomiting*, the patient should have small pieces of ice to suck; bismuth and hydrocyanic acid may be prescribed. Vomiting is often best relieved by giving small quantities of weak brandy and soda-water iced, or small quantities of iced champagne.

Pain.—If the patient can bear to lose a little blood, half a dozen leeches applied to the hypogastrium will often relieve it; otherwise, small quantities of morphine hypodermically ($\frac{1}{6}$ grain), and hot fomentations to the abdomen, should be ordered.

Diet.—Beef-tea, milk and soda-water, toast-water, should be given if they can be retained; if not, nutrient enemata should be tried till the vomiting subsides. Brandy is often necessary, and the state of the pulse will be a guide as to the quantity; it may be given either by the mouth, or in the nutrient enema.

The temperature.—Quinine in powders stirred up with a drachm of milk should be given, *e.g.*, gr. iij., three times a day. Sometimes an ice-bag to the head is useful in reducing the temperature.

Surgical treatment.—There are some cases where the best thing to do is to open the abdomen, and ascertain if the cause of the peritonitis is one that can be removed. This applies more particularly to cases not following some of the well-known antecedents of pelvic peritonitis. It would certainly be a mistake in almost all, if not in all, cases of pelvic peritonitis occurring soon after labour or abortion. There are some cases, however, where there should be no hesitation in adopting it, *e.g.*, if a patient is known to be the subject of an ovarian tumour, or if there is considerable probability that she has dilatation of the Fallopian tubes; and if in either case sudden symptoms of acute peritonitis arise, there should be no hesitation in opening the abdomen. A case of congenital atresia of the vagina with hæmatometra and hæmatosalpinx has been recorded above (p 97) in which some days after the relief of the vaginal atresia symptoms of acute peritonitis arose. The abdomen was opened, and the cause of the peritonitis was found to be double hæmatosalpinx. The contents of the tubes were septic, and on one side the tube had burst The patient made a good recovery

Simply opening the abdomen has proved very beneficial in some cases of tubercular peritonitis: the fluid is let out, and the wound closed without drainage. In these cases, however, the peritonitis is usually chronic, or at least only subacute. In America several cases have been recorded where abdominal hysterectomy has been performed during the puerperium for septic mischief, but the results are not very encouraging.

Treatment in chronic cases.—Here the pain and dysmenorrhœa are the chief symptoms requiring treatment. For the pain, blistering over the seat of the pain produces improvement, usually, however, of only a temporary character. Painting with iodine paint (Tr. iodi, Lin. iodi, āā partes æquales) is useful in a similar way. Hot vaginal douches, the douche being as hot as the patient can bear it, usually about 115° F., are also useful. The use of the glycerine plug

every night may be recommended.* A tampon soaked in a solution of ichthyol (5 per cent.) in glycerine, used once or twice a week, is often beneficial. In a large number of cases, however, improvement is only temporary, and the symptoms return. In some of these cases, where the symptoms and physical signs point to disease of the Fallopian tubes, there is no doubt that the removal of the inflamed uterine appendages is the proper treatment.

PELVIC CELLULITIS—PARAMETRITIS.

Etiology.—Injury, especially to the cervix, but also to the vagina and perineum, is the fundamental antecedent of pelvic cellulitis Septic matter gains an entrance at the point of injury, and inflammation is set up in the connective tissue; the connective tissue of the pelvis is primarily affected, though by extension the inflammation may spread to connective tissue far away from the pelvis, *e.g.*, behind the kidney.

The injuries referred to are usually produced *during labour or abortion*; laceration of the cervix being the most important. It is not the laceration in itself that causes the cellulitis, but the laceration allows the entrance of pathogenic organisms which set up the inflammation.

Parametritis is very rarely found except in women who have been recently delivered at or near full term.

Pelvic inflammation arising after abortion is much more likely to take the form of perimetritis than of parametritis.

Clinically in cases of parametritis there is practically almost always a history of recent labour.

Wounds of the cervix during operations would be a frequent cause of pelvic cellulitis, unless the operations were done with every antiseptic precaution. For instance, in performing the supra-vaginal amputation of the cervix, where the connective tissue at the sides of the cervix is opened up in a most extensive manner, provided the operation is done

* A glycerine plug is simply a piece of absorbent cotton-wool the size of a walnut, with a string four or five inches long tied round it. The plug is dipped in glycerine, squeezed rather dry, and passed into the upper part of the vagina. It is left in all night and pulled out in the morning, when the patient should have a vaginal douche.

aseptically, no pelvic cellulitis follows. In thirty-three cases of my own where this operation was done no cellulitis followed. In a case of fibroid polypus too big to remove through the os, where I incised the cervix posteriorly with the cautery, a phlegmon of the right broad ligament followed; I think, because the slough caused by the cautery could not be kept aseptic. Parametritis is very similar to whitlow. Clean punctures and cuts on the fingers heal without any cellulitis; but if dirt (*i.e.*, septic matter) gets into them, whitlow will probably be the result.

Morbid Anatomy.—There are three varieties of pelvic cellulitis; that is, three conditions in which we may see it in the post-mortem room.

These are:—

1. Phlegmon.
2. Abscess.
3. Gangrene.

1. **Phlegmon.**—When the exudation has not passed into the stage of suppuration, it is called *phlegmon.*

It is exceedingly rare to have an opportunity of seeing parametritis in the stage of phlegmon in the post-mortem room; cases of parametric phlegmon are common enough, but either the patients recover, or if they die, the cellulitis has usually by that time passed from the stage of phlegmon to that of abscess. The following is an account of a case, and a description of a specimen of parametric phlegmon, which I had an opportunity of examining post-mortem.

POST-MORTEM APPEARANCES OF A PHLEGMON OF THE BROAD LIGAMENT.

S. H., aged 39, was admitted into the London Hospital a few days after her confinement, suffering from mania and parametritis.

The physical signs of parametritis were well marked, there being a well-defined lump in the situation of the right broad ligament, displacing the uterus to the opposite side. The patient had also a good deal of bronchitis, and I think her death, which occurred on the tenth day after delivery, was chiefly due to the bronchitis.

On post-mortem examination, the layers of peritoneum forming the right broad ligament were found to be separated by exudation between them, so that from before back the broad ligament from peritoneal surface to peritoneal surface measured one inch and a half. The separation of

the layers of peritoneum forming the right broad ligament began at the lower border of the Fallopian tube, and extended downwards as far as the broad ligament extends. Externally the separation by exudation extended to the pelvic wall. The Fallopian tube was stretched over the convex upper surface of the swelling formed by the exudation between the layers of the broad ligament.

On cutting into the swelling, the cut surface had an appearance like that of a somewhat coarse sponge, there being seen holes of various sizes separated from one another by solid tissue.

The cavities referred to were filled with a sero-sanguinolent fluid, but none of them contained pus.

The largest holes would admit a No. 16 catheter.

The right ovary measured two inches and a quarter long, one inch and a quarter high, and three-eighths of an inch thick. Its surface was adherent to the adjacent peritoneal surface of the broad ligament by recent lymph. On section the ovary was found to contain an abscess, holding about half a drachm of pus.

On the left side the broad ligament was normal, when held up to the light, and looked at from before back, having its normal translucency.

The left ovary was two inches and a quarter long, five-eighths of an inch high, and three-sixteenths of an inch thick. It did not contain the corpus luteum.

The *uterus* was about six inches and three-eighths long, and measured about four inches and a half between the points of entry of the Fallopian tubes. The placental site was on the posterior wall, and presented a mammillated appearance. Elsewhere the surface of the uterine cavity was nearly smooth.

The exudation takes place into the connective tissue at the side of the cervix; from this situation it passes between the layers of the broad ligament to the side of the pelvis. Normally, the layers of the broad ligament, if held up to the light, are found to be translucent; when phlegmon of the broad ligament occurs, the layers of the peritoneum forming the broad ligament are separated for a considerable distance by the exudation, so that the broad ligament may measure from before back an inch or two inches in thickness.

The phlegmon forms a convex lump, over the upper surface of which are spread in order, from before back, the round ligament, the Fallopian tube, and the ovary. The appearance on section has already been described in the account of the case just narrated. It is to be noticed that some pelvic peritonitis affects the peritoneum overlying the inflamed pelvic connective tissue, as mentioned in that case. Sometimes the connective tissue in the utero-sacral ligaments

is implicated (utero-sacral cellulitis); and sometimes there may be a cellulitis of the connective tissue between the bladder and cervix.

2. **Abscess.**—If the inflammation go a stage further than phlegmon, an abscess is formed.

3. Lastly, the inflammation may be of so intense a character as to produce sloughing of the tissues affected—gangrenous parametritis. This is very rare.

Directions in which pelvic cellulitis spreads.—Here we must distinguish between the course taken by a *phlegmonous* cellulitis and a *purulent* cellulitis.

A phlegmon starting at the side of the cervix affects the connective tissue between the layers of the peritoneum forming the broad ligament; it may stop here, but if it spreads, it passes either (1) downwards along the round ligament to the groin, or (2) upwards to the connective tissue round the kidney, or (3) into the iliac fossa, or (4) sometimes it may extend upwards in the sub-peritoneal tissue of the abdominal wall.

A parametric abscess may spread in almost any direction; as contrasted with phlegmon, it is important to remember that it may spread over the brim of the pelvis down the thigh, or pass through the sciatic notch to the buttock, or through the obturator foramen to open at the upper and inner part of the thigh. Thus the spreading of a parametric abscess is a mechanical process, while the spreading of the inflammation in the stage of phlegmon is a vital process, not to be explained by mechanical considerations.*

Parametric abscess may open externally, commonly in the groin, above or below Poupart's ligament, or into the vagina, rectum, or bladder, very rarely into the peritoneum. Sometimes it may open in two directions, *e.g.*, there being one opening into the vagina, and another above Poupart's ligament; this is often due to separate foci of suppuration.

Remote parametritis.—When a cellulitis has spread to some distance from the pelvis, it may happen that while the inflammation and the signs of it at a distance are still evident enough, yet all signs of the cellulitis in the pelvis

* See *Clinical Lectures on Diseases of Women* (Matthews Duncan), 3rd edit., p. 236.

have disappeared. The distant cellulitis is known in such cases as "remote" pelvic cellulitis, or "remote" parametritis (Matthews Duncan).

The term "remote" is applied in the same way in cases of perimetritis.

Symptoms.—The symptoms are similar to those met with in pelvic peritonitis, with the exception that pain is less marked, and vomiting occurs less commonly. The patient lies with only one leg drawn up.

Physical signs in recent cases.—The exact signs vary according as we are dealing with the disease in the stage of phlegmon, or in the stage of abscess; in either case the

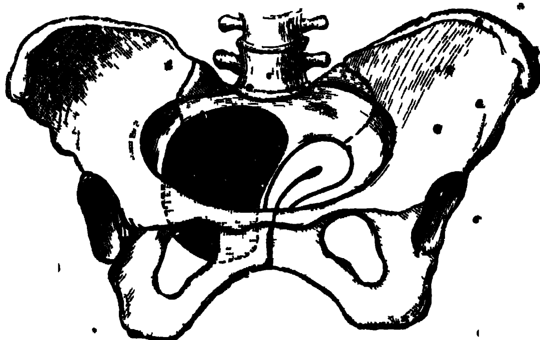


FIG. 200 —DIAGRAMMATIC REPRESENTATION OF THE LATERAL POSITION OF THE EXUDATION IN PARAMETRITIS (Thorburn)

markedly unilateral, asymmetrical character of the signs should be observed

In the stage of phlegmon—There is a lump on one side of the cervix, pushing the uterus over to the unaffected side. The lump obliterates more or less completely the concavity of the lateral fornix on the affected side, and produces an apparent shortening of the cervix on that side. The lump can very probably be reached on bimanual examination, and differentiated from the body of the uterus. The uterus and the lump have a certain small amount of mobility, differing from the absolute immobility in typical cases of pelvic peritonitis.

In the stage of abscess.—There are the physical signs of fluid, fluctuation, and dulness—that is, in cases where there is sufficient formation of pus—and it is so situated that these

signs can be made out. In certain cases, where at one stage we have recognised a phlegmonous inflammation, say in the iliac region, we notice, as it reaches the suppurative stage, a softening, a "bogginess," over the area of the lump which had previously been hard, rather than actual fluctuation. As regards dulness, it may happen that intestine intervenes between the lump and the abdominal wall, and then there will be a tympanitic note on percussion.

After an abscess has burst a fistula remains open for a long while, weeks or months. A probe may often be passed two, three, or more inches along a fistula of this kind for a long time after all acute symptoms have disappeared, and when convalescence is well established; in time it will close up by itself, and is best left alone. I have several times tried passing a probe, coated with nitrate of silver, along such fistulæ to hasten their healing, but have not been satisfied that it had much effect. Sooner or later, however, they have nearly always healed.*

Complications.—Acute inflammation may attack the knee-joint on the *affected side, or on the opposite side*, and the fluid in the joint may be serous or purulent. Phlegmasia dolens is a common complication of parametritis, affecting the leg of the side corresponding to the parametritis. There are often in such cases marked swelling and œdema of the labium majus on the same side as the parametritis.

LATE RESULTS OF PARAMETRITIS.

As absorption proceeds, the uterus may be gradually drawn over towards the affected side in cases where there has been cellulitis in one broad ligament. In less common cases, where there is cellulitis of the utero-sacral ligaments, contraction in this situation, pulling on the uterus somewhere near the junction of the cervix and body of the uterus in a backward direction, causes a marked anteflexion.

Clinically it is extremely difficult, if not impossible, if a case is seen at this stage for the first time, to be sure, if we

* In rare cases necrosis of a portion of bone in relation with a parametric abscess occurs. When this happens, a probe passed along the sinus resulting from the opening of the abscess will detect the dead bone. The healing of such a sinus cannot of course take place till the dead bone separates, and is removed. The patient may die worn out by the suppuration before this occurs.

find the uterus a little to one side of the middle line, that its position is not due to one broad ligament being congenitally shorter than the other, a condition that is common enough, rather than to previous cellulitis. Laceration of the cervix on the side towards which the uterus deviated would be in favour of a previous cellulitis. As regards old cellulitis in the utero-sacral ligaments producing anteflexion, a difficulty of a somewhat similar character arises. For what is the evidence of old cellulitis of the utero-sacral ligaments? Merely feeling bands running in the situation of these ligaments, and concluding that the bands are a little thicker and more defined, and perhaps shorter than usual. I have noticed in many cases, where a retroflexed uterus was found incarcerated in Douglas' pouch and replaced, that after replacement these bands, the utero-sacral ligaments, were particularly easily defined, and this in cases where there was no reason to suppose there had been any previous utero-sacral cellulitis; so that, while admitting that cellulitis in this situation would cause anteflexion, as absorption proceeded, it must also be said that in practice we can rarely be certain that we have before us a case of old cellulitis of these ligaments.

Post-mortem room evidence in the case of old cellulitis is on quite a different footing from the same evidence in cases of old pelvic peritonitis; in the case of the latter the evidence in the shape of adhesions, instead of the uniform glistening surface of the peritoneum, is unmistakable. If we find adhesions, there has been peritonitis; but in the case of cellulitis, long after the acute stages have passed, and absorption is as complete as it ever will be, the nature of the case renders it almost impossible to say there has at some time or other been cellulitis. Take, for instance, a case where there has been cellulitis years before on one side of the cervix, the question would be as to whether the connective tissue found in that situation was more abundant and denser than in the normal condition; and any one who will examine the connective tissue, normally present there, will see the difficulty or impossibility of deciding such a question. In the one hundred specimens I examined, I was unable to say positively in a single case that there had been *old* pelvic cellulitis. No doubt there had been pelvic cellulitis years ago

in some of them; but its traces were not definite and unmistakable, as they are in pelvic peritonitis.

Treatment.—The treatment is similar to that in pelvic peritonitis, with such slight modifications as are at once obvious (see p. 371). Pelvic cellulitis terminates in abscess much more frequently than pelvic peritonitis. When a pelvic abscess has formed, whether it be due to perimetritis or parametritis, the best treatment is to open it with antiseptic precautions at whatever point seems most convenient. In cases of parametric abscess it is best to wait till the abscess definitely points before opening it.

A word of caution is desirable as to laparotomy undertaken for pelvic swellings or lumps within a comparatively short time of labour. If such a lump is parametric, and is not recognised as such, a great deal of harm may be done in attempting to "remove" such a lump. The lumps due to parametric exudation are extra-peritoneal, and consist, as has been said, of the pelvic connective tissue enormously thickened by the pouring out into it of inflammatory exudation. An attempt to "remove" a parametric lump may be most disastrous, since embedded in the inflamed connective tissue are various important vessels and other structures—the ureters, for instance.

Case of parametritis following labour, illustrating extension of the inflammation along the right round ligament to the labium majus, and complicated with suppuration in the left knee-joint.

S. A. H., aged 35, nine children, the last eight days ago The last confinement was difficult, and instruments were used, this had never been the case before. Admitted into the London Hospital, December 20, 1886, complaining of pain in the right iliac region, and of great weakness since the confinement.

Temperature on admission, 102°

On the day after her confinement she was seized with shivering fits, which occurred twice the same evening, and on the three succeeding nights. She had also had pain on defæcation, and trouble on micturition; twice the urine had to be drawn off.

December 23.—Rigor, Temperature, 101·8°. The left knee-joint is very painful, and contains fluid. A swelling is felt in the hypogastrium reaching 2 inches above the pubes, and extending outwards about equally on each side of the middle line.

The right labium majus is swollen, so as to form a sausage-shaped

swelling 1⅞ inch across and 4½ inches long. The swelling reaches upwards in the direction of the inguinal canal. Left side of the vulva is normal.

Vaginal examination.—Most of the swelling in the hypogastrium is the uterus. Some indistinct thickening is felt to the right of the uterus, much less than was found in that situation on admission. Uterus fairly movable. Sound passes 3 inches. The swelling in the right labium was aspirated, and, as pus came out, a free incision was made into it antiseptically.

December 29.—Left knee-joint aspirated; pus came out. The case was now transferred to Mr. Tay. Further treatment consisted of keeping the joint at rest on a splint, and aspirating it twice. The patient did well, and the joint recovered completely.

Case of suppurative parametritis following labour.—Abscesses opening into the vagina, and above Poupart's ligament.

S. J., aged 32, seven children, the last a month ago, admitted into the London Hospital, June 7, 1887.

Confinements had all been difficult Last child delivered with forceps.

When a month pregnant in her last pregnancy, had rheumatic fever (there is a well-marked mitral systolic murmur), and had to remain in bed seven months. The joints chiefly affected were those of the left leg and arm.

On admission, temperature 101° (see chart for subsequent temperature). Complained of forcing pain on passing her water.

Note on June 9.—Abdomen distended. Umbilicus level with the skin. A distinct hard mass is felt occupying the left iliac region, reaching three fingers' breadth above Poupart's ligament; the mass does not extend beyond the middle line.

Measurements of the pelvis.—Between ant. sup. il. sp. = 9½ inches. Maximum distance between the iliac crests = 10½ inches. External conjugate = 6¾ inches.

It was therefore a slightly generally contracted (or justo-minor) pelvis. Patient cannot extend the left thigh. Says she has not been able to do so for eight months

Left labium majus larger than right

Uterus nearly fixed. Cervix lacerated on both sides. Hardness extends outwards from the left side of the cervix to the pelvic wall, and is continuous with the lump felt in the left iliac region.

The finger in the vagina feels a somewhat cylindrical swelling, posteriorly parallel to the vagina; this is not satisfactorily accounted for by fæces in the rectum, and seems to be due to a cellulitis of the connective tissue between the vagina and rectum.

July 2.—On June 27 a discharge of very offensive pus in considerable quantity came from the vagina during the night. On June 29 the pus became sanious, and has continued so since.

July 4.—With Sims' speculum the opening from which the pus is coming can be distinctly seen; it is situated on the posterior wall of the vagina, about an inch up. The swelling in the left iliac region is softer than before.

July 28.—Where the hard mass had been in the left iliac region there is now an abscess on the point of bursting; it was therefore opened, and a drainage tube inserted.

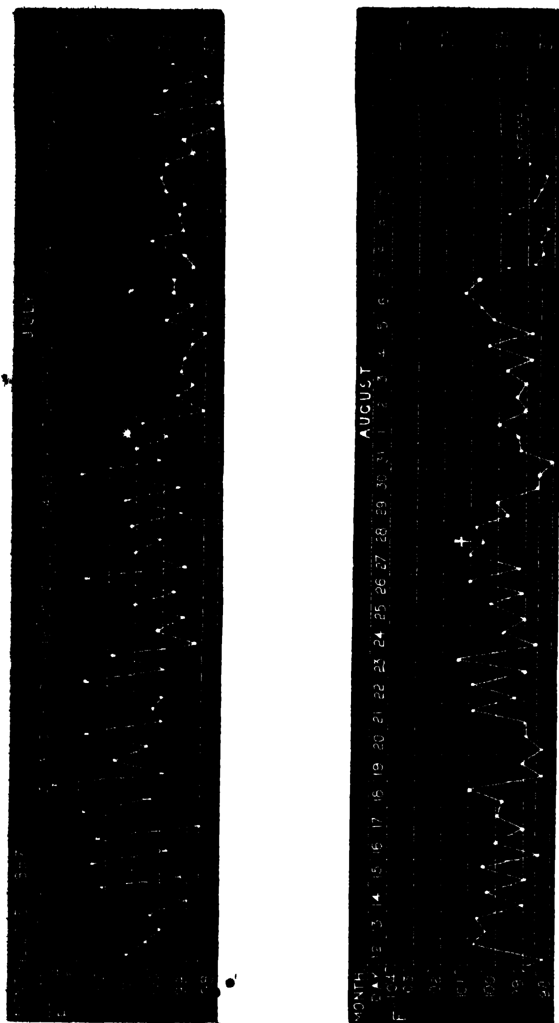


FIG. 201.—Temperature chart of S. J., case of suppurative parametritis following labour. The case was one of about the average duration. June 27.*—Discharge of pus from the vagina; the temperature then remained much lower till the middle of July, when the abscess in left iliac region was forming; this was opened on July 28.† After August 11 the temperature remained normal.

September 5.—The temperature has been normal since August 9. Patient is looking fat and well. Uterus is still nearly fixed, and there is still difficulty in extending the left thigh.

CHAPTER XV.

PELVIC HÆMATOCELE.—EXTRA-UTERINE GESTATION.

Pelvic hæmatocele.—There are two varieties of pelvic hæmatocele :—

1. The intra-peritoneal ; and
2. The extra-peritoneal.

In the intra-peritoneal variety the blood is effused into the peritoneal cavity; in the extra-peritoneal into the sub-peritoneal connective tissue.

CAUSATION.

Mode of production.—1. In an overwhelming majority of cases the cause of pelvic hæmatocele is ectopic gestation. The blood finds its way into the peritoneal cavity either from the open mouth of the tube during attempts, successful or unsuccessful, on the part of the Fallopian tube to expel the ovum through the fimbriated opening, or from rupture of the tube wall produced partly by the tension, but chiefly by erosion of the tube wall by the cells of the trophoblast. In the latter case, according to the position of the rent in the tube wall, there will result either an intra-peritoneal, or an extra-peritoneal pelvic hæmatocele. If the rupture occurs in the part of the expanded tube covered by peritoneum, then the hæmatocele will be intra-peritoneal. If, on the other hand, at the lower part of the tube, the part not covered by peritoneum, the blood will be poured into the connective tissue between the layers of peritoneum forming the broad ligament, and the resulting hæmatocele will be extra-peritoneal. Similarly, when pregnancy takes place in a rudimentary uterine cornu, a time comes when rupture

occurs with profuse intra-peritoneal hæmorrhage, giving rise, if the patient survive, to pelvic hæmatocele.

2. *Reflux of blood along the Fallopian tubes during menstruation.*

Till about 1883, when Lawson Tait first operated on a case of ruptured tubal pregnancy, this group was considered to comprise almost all cases of pelvic hæmatocele. There was always great difficulty in explaining why the menstrual blood, instead of following its usual channel, should, in certain cases, regurgitate along the Fallopian tube into the peritoneum. The probability now is that, although such a thing is theoretically possible, it very rarely, if ever, occurs. Indeed, for practical purposes, clinically there need be little hesitation in regarding pelvic hæmatocele as symptomatic of extra-uterine pregnancy.

Rupture of a Graafian follicle may be attended by a more abundant escape of blood than usual, and so cause hæmatocele.

3. *Rupture of a vein, either in the broad ligament or under the peritoneum covering the uterus*, may be the source of hæmatocele, either intra- or extra-peritoneal Such a rupture would be more likely to occur if the vein were varicose, and during the congestion of a menstrual period.

4. *Rupture of an ovarian cyst; rupture of the uterus.*

5. *Rupture of a vein in the capsule of a fibroid tumour* towards the peritoneal aspect.

Practically almost all cases of pelvic hæmatocele are due to ectopic gestation.

MORBID ANATOMY.

Intra-peritoneal hæmatocele.—When the blood is effused into the peritoneal cavity, it gravitates into Douglas' pouch, and coagulates. In twenty-four hours the coagulum has become enclosed by adhesive peritonitis set up round it. The boundaries, for instance, of a hæmatocele just big enough to fill Douglas' pouch would be *below*, of course, the pouch, and *above*, coils of intestine glued to one another and to the edge of Douglas' pouch by adhesive peritonitis. If the effusion is considerable, the blood not only fills Douglas' pouch, but the rest of the cavity of the pelvis, and may,

when coagulated and surrounded by adhesive peritonitis, form a lump that can be felt a variable distance above the pubes: for example, as high as the umbilicus. It is certain that such is the course of events when no peritonitis, old or recent, existed previous to the escape of blood; but no doubt in many cases peritonitis has existed previously and led to adhesions, so that when the blood escapes it finds itself limited by the adhesions. Thus in one set of cases the first thing is the escape of blood into the cavity of the peritoneum and its coagulation there, and then follows adhesive peritonitis in the neighbourhood of the clot. This is, no doubt, the course of events in the majority of cases. In another set of cases there has been at some previous time a pelvic peritonitis leading to adhesions, which may cut off a part of the general peritoneal cavity from the rest: then, if the causes producing hæmatocele come into operation, blood may be effused into the small compartment of the peritoneum so shut off.

Extra-peritoneal hæmatocele.—The blood here escapes into the connective tissue at some part of the pelvis, usually into that of the broad ligament, or at the back of the supra-vaginal cervix. The potential space being obviously limited, the quantity of blood so effused cannot be great. Exceptionally, after the effusion has occurred into the sub-peritoneal tissue, the tension of the peritoneum over it becomes so great that the peritoneum itself ruptures, and bleeding then occurs into the general peritoneal cavity.*

Symptoms.—It has been already mentioned that, apart from the history, it is impossible in many cases to distinguish between pelvic peritonitis and pelvic hæmatocele. What, then, is the history?

We find that the patient was *suddenly* seized with severe pain in the lower part of the abdomen, that she became at the same time faint, perhaps actually unconscious. There may have been a sense of nausea only, or nausea followed by vomiting. If the quantity of blood effused has been considerable, the patient is markedly anæmic. Such a history points strongly to there having been a pelvic hæmatocele, and it

* I have seen an instance of this in a case of partial rupture of the uterus, limited to the peritoneal covering on the posterior aspect of the lower uterine segment, occurring during labour. The patient died of the hæmorrhage.

becomes even more suggestive if there is a slight metrorrhagia at the time of the seizure, especially if the patient has missed the last menstrual period. From the time of onset to the time the patient is seen there will have been the ordinary symptoms of pelvic peritonitis, pain in the lower part of the abdomen, and very likely trouble in connection with micturition or defæcation. Sometimes bleeding from the vagina persists for some time after the onset.

The history to be sought which would point to the

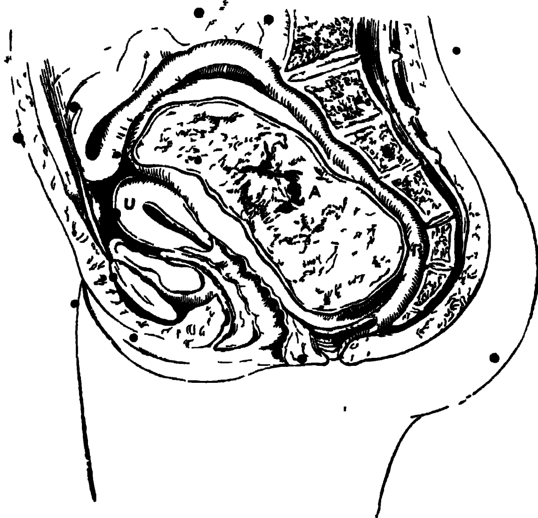


FIG. 202.—RETRO-UTERINE HÆMATOCELE (Barnes).
U. Uterus; R. Rectum; A. Blood-clot. Note how the uterus is pushed forward and elevated.

presence of extra-uterine pregnancy is something of this kind: The patient had gone two or three weeks over her time for being "unwell," and fancied she might be pregnant; she then became, as she thought, "unwell" again. She may have passed a decidua from the uterus. There will have been more or less pain in one or other iliac region. So far the history is only that of an extra-uterine fœtation previous to rupture of the sac, and has nothing to do with hæmatocele; but if now *tubal abortion occurs* or the sac ruptures, so as to

produce intra-peritoneal hæmorrhage, there will be the symptoms mentioned above, sudden pain in the pelvis, faintness, nausea or vomiting, collapse, and anæmia, with small rapid pulse—120 or more. During the first twenty-four hours the temperature will probably be sub-normal, but afterwards there may be slight fever. If the hæmorrhage is profuse, death follows; if the bleeding ceases before a fatal quantity has been lost, the blood poured into the peritoneum behaves as above described, and becomes encysted by surrounding pelvic peritonitis. Sometimes the sac ruptures, not into the peritoneum, but into the subperitoneal connective tissue, and the symptoms are then much less definite.

As regards the cases dependent on rupture of a vein.—If the result is a subperitoneal hæmatocele, the symptoms are vague; if, on the other hand, it causes an intra-peritoneal hæmatocele, they are well marked, and the same as those produced in other cases by escape of blood into the peritoneal cavity.

Physical signs.—*Intra-peritoneal hæmatocele.*—At first, within a few hours of the occurrence, there can only be felt a sense of fulness in Douglas' pouch. In one case seen while the blood was not enclosed by adhesions, I was able distinctly to feel fulness in this position. In another, where a copious intra-peritoneal effusion of blood occurred from rupture of the uterus, abdominal palpation gave one a sense of there being something unusual in the general peritoneal cavity, without one feeling sure what it really was (till the post-mortem examination). In cases due to tubal pregnancy I have often noticed a special degree of tenderness in the corresponding iliac region on abdominal palpation; and I think this point a most suggestive one. After forty-eight hours the coagulated blood is enclosed by adhesive peritonitis, matting together the viscera in the immediate neighbourhood. Now, on abdominal examination, we shall feel a lump rising out of the pelvis to a variable distance above the pubes. If the hæmatocele be only a small one, we may not detect any lump by mere abdominal palpation. The abdomen is somewhat distended, and tender.

On vaginal examination we find the uterus pushed forwards, close behind the pubes, but not as a rule displaced

laterally. In some cases the uterus is raised, while in others it seems lower than normal. Behind it, through the posterior vaginal wall, we feel a lump more or less hard, and symmetrically situated as regards the middle line. The uterus is fixed. It is usually quite easy on bimanual examination to identify the fundus of the uterus just behind the pubes. This closeness of the uterus to the pubes, and the ease with which its position can be identified, are very significant of pelvic hæmatocele. It will be seen, on referring to the physical signs of pelvic peritonitis, that they may be precisely the same; hence the importance of the history, on which alone we can found a diagnosis.

Extra-peritoneal hæmatocele.—The position of the lump formed by the thrombus is similar to that of the exudation in cases of pelvic cellulitis, *i.e.*, at one side of the uterus, displacing it to the other side.

Diagnosis.—As regards the intra-peritoneal variety, it will be seen that diagnosis depends on a distinct history of sudden onset being obtained following on symptoms pointing to extra-uterine pregnancy

Marked enlargement of the uterus, softening of the cervix, and a patulous condition of the os uteri are strongly in favour of extra-uterine pregnancy.

As regards the extra-peritoneal variety, it is impossible to diagnose the existence of it with any certainty, unless there is a history of extra-uterine fœtation.

Prognosis.—If the hæmorrhage is considerable, and the blood escapes freely into the general cavity of the peritoneum, death may follow in an hour; if the quantity of blood lost is not so great as to cause death from hæmorrhage, the clot, as we have seen, becomes enclosed by adhesions, and the prognosis is much less serious. Ultimately, after a period of some months, in most cases the clot becomes absorbed; exceptionally, suppuration may occur, and the case become one of pelvic abscess; and as regards prognosis and treatment, what has been said under suppurative para- and perimetritis applies.

Treatment.—If the case is seen soon after the escape of the blood, very careful consideration should be given to the question as to whether the case is really one of ruptured

extra-uterine pregnancy. Here the history may help us, the patient having perhaps gone some weeks over her time without menstruating, having suffered from pain in one or other iliac region, having herself thought that she was pregnant. If on vaginal examination, within twelve hours after the onset of the symptoms, a tumour can be felt at one or other side of the uterus, and if the tumour is more or less fixed, there is considerable probability that the case is one of rupture of an extra-uterine gestation, because such a tumour cannot be due to hæmatocele, sufficient time not having elapsed for one to form.

In such a case an exploratory abdominal section is the best practice.

If, both on account of the history and of the physical signs (absence of a tumour in the pelvis, and merely a feeling of fulness in Douglas' pouch), we conclude it is not a case of extra-uterine gestation, or, being a case of extra-uterine pregnancy, if we decide for the time being not to operate, the patient should be merely kept at rest in bed, with an ice-bag over the hypogastric region. Stimulants must be given according to the degree of collapse present; and if they cannot be given by the mouth, may be given by enema (℥ j. of brandy, with ℥ iij. of coffee, or with ℥ iij. of beef-tea). Better still, rectal injections of normal saline solution may be given at frequent intervals through a soft tube. Pain must be treated by hypodermic injections of morphia. In general, however, it is better to operate as soon as possible, so that the source of the hæmorrhage may be adequately dealt with.

The following case is an example of hæmatocele due to the rupture of an extra-uterine gestation sac. This case occurred twenty-five years ago.

Although the patient did well, in a similar case at the present time I should certainly perform laparotomy, and do what was necessary from above.

P. R., aged 27, married eight years, two children, the last four years ago, no miscarriages, was admitted into the London Hospital on April 17, 1886, complaining of pain in the right iliac and lumbar regions, also in the hypogastrium.

History.—Patient was last "poorly" on March 28, 1886; the period

lasted seven days, and she passed a clot one inch and three-quarters long. Before this she had "seen nothing" for two months. She had a dull aching pain in the lower part of the abdomen, on and off, like that which she had three years ago. The pain was somewhat relieved on March 28, when the period began.

It seems that the pain referred to first came on three years ago when she was suckling her second child, which she did for twelve months.

She thinks it was caused by catching cold just before she expected to be unwell.

The period did not come on, and she saw nothing for six or seven weeks; then she became "poorly," and passed a clot exactly like the one she passed recently in March last.

Catamenia first appeared when she was thirteen, occurred regularly every four weeks, lasting three or four days, and were unattended by any pain till three years ago.

Since then she had had pain for two or three days before each period.

Since marriage, had menstruated every three weeks, and had lost much more than before.

State on admission (April 17, 1886).

Uterus movable, but less so than normal; an elastic swelling the size of a large egg, somewhat fixed, is felt occupying the right posterior quarter of the pelvis. Sound passed three inches. Cervix torn bilaterally; there is a granular erosion, or eversion, round the external os. Temperature 100°.

From April 17 to April 24 temperature normal.

April 24.—Temperature rose to 101°. Patient was nearly doubled up with severe pain in the lower part of the abdomen. Twelve leeches were applied to the hypogastrium, after which the pain was relieved considerably, no marked collapse.

April 26.—Patient began to lose blood from the vagina. Still some pain at short intervals in the same place as before.

May 3.—Since April 24 the temperature has gone up at night to 100° or 101°, falling to normal in the morning.

Vaginal examination (May 3).—The uterus is very low down, and pushed close behind the pubes. A tumour is now felt behind the uterus, bulging down the posterior vaginal wall, and extending laterally across the pelvis.

May 6.—Temperature at night has been high since the last note. It was thought that suppuration was taking place. An incision an inch across was made into the tumour through the posterior vaginal wall close to the cervix. Some dark blackish fluid and chocolate-coloured clot escaped from the opening.

May 10.—The finger was passed cautiously into the cavity to see if any loose pieces of clot were present. What was thought to be a large piece of loose clot was hooked out, but on subsequent examination it was seen to be a fœtus (which was shown at a meeting of the Obstetrical Society of London, and is now in the London Hospital Museum).

Great difficulty was experienced in keeping the cavity sweet, in spite of frequent irrigation of carbolic acid lotion (1-40) and the introduction of iodoform into it, and on May 16, the temperature having been 104° for the preceding two nights, an attempt was made under ether to remove any portions of the decomposing clot that seemed ready for removal. While doing this a very sharp attack of hæmorrhage from the cavity of the hæmatocele occurred; it was only controlled by plugging the cavity with gauze. The gauze was removed two days after.

Subsequently the patient did very well, and left the Hospital in the second week in July. A shallow depression in the posterior fornix with rather sharp edges remained indicating the position of the incision. There was a little thickening round it. The uterus was freely movable.

I have thought it well to insert here an outline of the subject of extra-uterine gestation, as it is so closely related to that of pelvic hæmatocele, and, as regards differential diagnosis, to some other conditions forming pelvic tumours, especially small ovarian tumours, and pyosalpinx.

EXTRA-UTERINE GESTATION.

It may now be considered that, whenever a fertilized ovum develops in any other place than in the uterus, its situation is almost always primarily in some part of the Fallopian tube. Thus nearly all cases of extra-uterine gestation are primarily examples of **tubal pregnancy.**

A few examples of primary *ovarian* pregnancy have been recorded, which are of great pathological interest. Clinically, however, such cases may be expected to behave similarly to those of tubal pregnancy.

The development of an ovum in the Fallopian tube most commonly occurs in the outer and wider part of the tube, termed the *ampulla*; less frequently in the narrower inner portion, called the *isthmus*; and very rarely in that part of the tube, called the *interstitial* portion, which passes through the uterine wall.

Etiology.—*Antecedent sterility.*—As a matter of clinical experience, we generally find, in cases of tubal pregnancy, either that the patient has been previously absolutely sterile, or that a period of sterility of some years' duration has preceded the occurrence of the extra-uterine gestation. To this general rule, however, there are numerous exceptions.

In one of my own cases, for instance, the patient had borne a child at term only nineteen months previously.

Age.—As might perhaps have been anticipated, the period of life during which patients are most liable to become the subjects of extra-uterine pregnancy is also that during which normal pregnancy is most likely to occur. According to Matthews Duncan, the fecundity of the mass of married women, from the earliest years of child-bearing onwards, gradually wanes to its extinction. He says wives under thirty are more than twice as fecund as wives above thirty. Several of my own cases of extra-uterine pregnancy have been about twenty-eight years old. Very few cases occur after forty or before twenty-five.

No very satisfactory explanation can be given as to why ectopic pregnancy occurs. Fertilization of the ovum takes place normally in the Fallopian tube, and what we have to explain is why the fertilized ovum remains in the tube instead of passing on into the uterus.

Course and Progress.

When a fertilized ovum has lodged in the Fallopian tube, it may either—

1. From an early period degenerate into a mole. Thus there are **tubal moles** as well as uterine moles.

2. **Tubal abortion** may take place. When the ovum is lodged in the outer part of the Fallopian tube, changes generally take place in the neighbourhood of the fimbriated opening of the tube, which lead to its closure. In cases where the fimbriated end of the tube continues open, it is easy to imagine how the ovum may be discharged through it into the peritoneum; a process of miniature labour occurs in the tube. The fimbriated opening dilates widely (in a manner similar to that of the os uteri in uterine abortion) and the ovum, or mole, is expelled into the peritoneal cavity. I have myself observed several cases of this kind at operations for extra-uterine pregnancy. The fimbriated end of the tube was widely dilated, and the tubal mole was projecting through the opening into the peritoneal cavity. The ovum may be discharged entire into the peritoneal cavity, with more or less severe intra-peritoneal hæmorrhage; or several successive

intra-peritoneal hæmorrhages may occur, the ovum still remaining in the Fallopian tube. This would be an instance of *threatened tubal abortion*, analogous to what occurs when abortion is threatening in a case of uterine pregnancy.

In tubal moles there may, or may not, be an amniotic cavity to be seen on cutting the mole across; and, as in uterine moles, there may, or may not, be some trace of the fœtus to be seen. When there is no amniotic cavity visible, the real nature of the mass may be ascertained by cutting sections of it, and examining them for chorionic villi. (See Plates XI. and XII.) In some cases shaggy projections consisting of chorionic villi can be distinctly recognised with the naked eye on the outer surface of the mole. In cases where rupture of the tube has occurred these shaggy projections may often be seen protruding from the rent (Fig. 209). Or—

3. The ovum may continue to develop in a fairly normal manner for a time. At length, owing to thinning of the Fallopian tube, and continued increase in the size of the ovum, a time comes when the wall of the Fallopian tube gives way.

This generally occurs before the fourteenth week; but the tube often ruptures at a much earlier date. The rupture may be *intra-peritoneal*, or *extra-peritoneal*. If the tube ruptures at some part of its circumference covered by the peritoneum, then we have intra-peritoneal rupture, and hæmorrhage occurs into a space the capacity of which may for practical purposes be regarded as unlimited. On the other hand the tube may rupture at that part of its circumference which is not covered by peritoneum, and lies towards the space between the layers of the broad ligament. We then have an extra-peritoneal rupture, and the blood is poured out into a relatively small space the capacity of which is limited, so that the amount lost is inconsiderable compared with what is lost in the former case.

Intra-peritoneal rupture is much the more common of the two varieties.

As regards intra-peritoneal rupture, in early cases the ovum may be expelled with more or less blood into the peritoneum. If the quantity of blood is not great, the patient does not die,

The effused blood forms a pelvic hæmatocele, and the whole mass is ultimately absorbed.

In more advanced cases the ovum is not always expelled, at all events completely, and more or less hæmorrhage may continue for some time. In some cases of my own, where the fœtus has been of eight to ten weeks' development, it has been expelled into the peritoneum, while the placenta has



FIG. 203.—ECTOPIC GESTATION. SECTION THROUGH GESTATION SAC SHOWING EARLY VILLI. (*Micro-photograph.*)

The section shows a number of early villi with well marked, deeply stained Langhans's layer. In places Langhans's layer is proliferating in the form of buds from the surface of the villus. To the left of the villi is seen some decidual cell change in the muscular layers of the tube. Below the clump of villi, and separated from it by tube muscle, is the lumen of the tube, with a single flattened villus projecting into it. The lumen itself contains organizing blood-clot. The gestation sac is therefore intra-mural, and has burrowed its way from the tube lumen.

remained wholly, or partially, attached within the tube. It is important to observe that rupture of the Fallopian tube may be met with in cases of tubal mole, as well as in those where

the tube contains a recognisable fœtus. It should also be borne in mind that rupture may occur even when the fimbriated end of the tube is patent

When intra-peritoneal rupture of the tube occurs, if the amnion has not ruptured, or much harm been done to the placental site, the ovum may go on developing even to full term.

As regards extra-peritoneal rupture, hæmorrhage occurs into the space between the layers of the broad ligament, and the ovum, gradually, finds its way into the loose tissue lying between those layers It may now die, and cause no more danger. Exceptionally, however, just as in the intra-peritoneal rupture, if the amnion is not ruptured, or the placental site seriously involved, the ovum may continue to develop. This extra-peritoneal development of the ovum to an advanced period may result in raising the peritoneum from the pelvis and anterior abdominal wall

In cases of advanced extra-uterine gestation, which originate as described, it is a matter of great importance whether the placenta is situated below, with the fœtus above ; or whether, on the other hand, the placenta is at the highest part of the sac, and the fœtus below it The latter relation is much the more dangerous for the mother.

In both cases the sac is liable to an intra-peritoneal rupture. If the placenta is situated above, at the highest point of the sac, this accident is attended with very severe, and probably fatal, hæmorrhage If the placenta is situated below, rupture of the sac allows the escape of the liquor amnii and of the fœtus into the peritoneum Thus the fœtus may be found, and has been found, free among the intestines.

In the event of an advanced extra-uterine gestation proceeding to term without fatal rupture, a kind of spurious labour occurs, after which the fœtus dies, and undergoes mummification, or, by the deposit of calcareous salts, conversion into a *lithopædion*

A case is on record where a patient survived, carrying within her an extra-uterine fœtus of this kind for fifty-two years

In many of these advanced cases, however, when the death of the fœtus has occurred, after a longer or shorter

time the extra-uterine sac becomes infected from the intestines, and undergoes suppuration. The resulting abscess ultimately opens spontaneously: it may burst into the bowel, the bladder, the vagina, or even through the uterus. It may also open externally. Fœtal bones are discharged at intervals through the opening. I have myself removed portions of the parietal bones which had become impacted in the rectum in a case of this kind. Sometimes the spontaneous opening of such abscesses is spoken of as *secondary extra-peritoneal rupture*.

The following is an account of a case of gestation occurring in the *interstitial* portion of the Fallopian tube:—

A. D, aged 34, had had six children, the last about a year and ten months before admission. At the time the accident happened she believed herself to be five months pregnant. She had not menstruated for five months. Nothing had occurred during the pregnancy different from what she had experienced on other occasions. On October 12, about 3 p.m., while going upstairs, she was suddenly seized with severe pain in the abdomen, and became rapidly blanched and collapsed. When the pain seized her, she felt as if something had given way in the abdomen, and stated that she heard a crack. Vomiting occurred soon after. She was seen by some one from a neighbouring dispensary, but after a time, the friends becoming alarmed Dr Wheeler Brown was called in. This was about 11 p.m. He at once recognised the gravity of the case, and brought the patient up to the London Hospital. She was admitted about one o'clock in the morning, and shortly afterwards Mr. Blaxland, the Resident Accoucheur, sent for me. When I saw the case, about a quarter-past two, the patient was much less collapsed than I was told she had been some time before. She was able to answer questions, and in fact supplied most of the history that has been already given. The pulse was small and compressible (120). She looked pale and anxious, and complained of pain over the abdomen. The abdomen was tender. The patient was very fat (subsequently it was found there were two inches of fat in the abdominal wall), and nothing definite was made out by palpation. She was then examined under chloroform, her own consent and that of her husband having been previously obtained to an operation if it should be thought desirable. Even under chloroform the examination was unsatisfactory. The abdomen, on palpation, had an indistinctly "doughy" feeling. On vaginal examination the uterus was made out to be much smaller than would correspond to a five months' pregnancy, and it had not the globular shape of the pregnant uterus. There was slight oozing of blood from the os uteri. According to the history there had not been more than a mere trace of blood lost from the vagina.

This being the state of the case, it will be seen that the diagnosis presented very great difficulty. First, as regards the existence of preg-

nancy at all, there was nothing to rely on but the patient's own statement. It is true there was a little milk in the breasts; but in a woman who had had a child only twenty months previously, and had suckled it, this of course was worth very little. The fœtus could not be felt on palpation of the abdomen; and by vaginal examination it was certainly ascertained that the uterus did not, at the time of examination, contain an ovum of anything like five months' development. Again, considering the question of tubal fœtation, according to the patient's account, she was five months pregnant, and had not menstruated during that time, nor suffered from any pain in the abdomen; whereas, had it been a case of tubal fœtation,



FIG. 204.—THE UTERUS FROM THE AUTHOR'S CASE OF INTERSTITIAL TUBAL GESTATION (A.D.), DESCRIBED IN THE TEXT.

The uterus has been laid open along the anterior aspect; a glass rod (*E*) has been passed from the cavity of the gestation sac into the cavity of the uterus. *F F* point by dotted lines to the thick decidua lining the cavity of the uterus. The specimen is in the London Hospital Museum.

we should have expected rupture to have taken place at least two months earlier, and also that there would have been a history of irregular hæmorrhage and more or less pain.

I came to the conclusion that the best plan would be to make an exploratory incision, as, even if the diagnosis should turn out to be wrong, the patient's risk would not thereby be much increased. On opening the peritoneum it was found to contain a large quantity of blood and recent clot, and the hand came upon a fœtus and placenta lying loose among the

intestines. The fœtus lay much nearer the liver than the uterus, the placenta being midway between the fœtus and the uterus. The membranes, which were twisted into the form of a band, passed downwards and to the left, and were found to lead to a tear in the left side of the fundus uteri. The rent was still bleeding a little. The fœtus, placenta, and blood-clots were removed, and the tear in the uterus stitched with deep sutures of silver wire and superficial catgut sutures. A glass drainage-tube was inserted at the lower angle of the abdominal wound, and this was closed in the usual way. The patient was very cold when

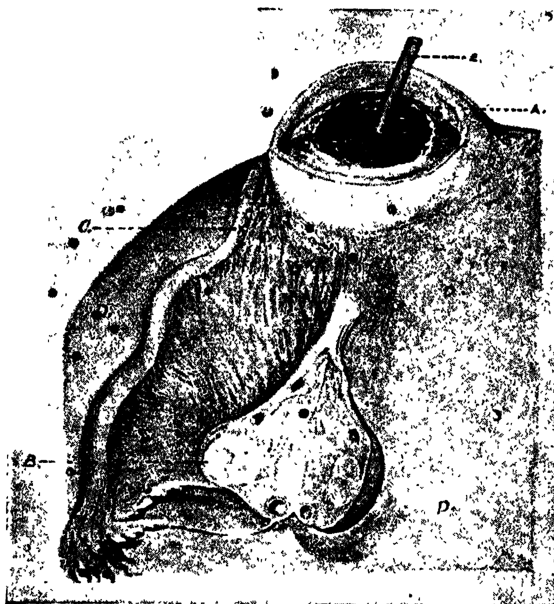


FIG. 205.—PART OF THE UTERUS AND APPENDAGES OF THE LEFT SIDE, SEEN FROM ABOVE AND BEHIND (from the author's case of interstitial gestation A.D.). The ruptured gestation is seen above, with the glass rod. The ovary has been cut open, and the corpus luteum is well seen. *A*. Cavity of ruptured gestation sac; *B*. Corpus luteum; *C*. Fallopian tube; *D D D*. Peritoneal coat of uterus; *E*. Glass rod passed from the gestation sac through the uterine opening of the tube into the cavity of the uterus.

removed to bed. Hot bottles were applied to the feet, and enemata of brandy given. She recovered consciousness about 9.30 a.m., and complained of pain, but gradually sank, and died about 12 (noon), seven hours after the operation.

A careful examination of the uterus was made after death. The sutures used for the tear at the operation were removed. On opening the uterus it became at once evident that the fœtus had never been

in utero at all. The cavity of the body of the uterus was lined by a decidua from one quarter to three-eighths of an inch thick, in places partly detached. A glass rod passed from the cavity of the uterus through an aperture corresponding in position to the inner end of the left Fallopian tube, and appeared at the inner end of the tear in the fundus. Evidently then the ovum had developed in that part of the left Fallopian tube which passes through the wall of the uterus—that is to say, it was a case of interstitial gestation. The tear extended from the point where the left Fallopian tube entered the uterus inwards, and a little backwards across the fundus. The tear was two inches and a quarter long and two inches deep. At the inner end of the cavity formed by the tear, looked at from above, was a round hole, about three-sixteenths of an inch in diameter,

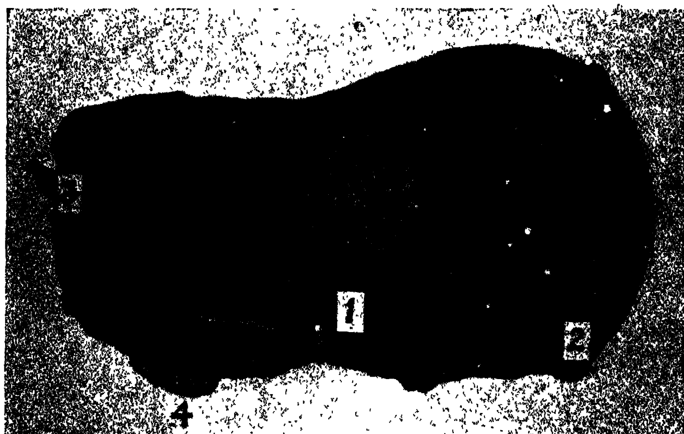


FIG. 206.—INTERSTITIAL GESTATION AT THE THIRD OR FOURTH MONTH WHERE THE SAC WAS REMOVED UNRUPTURED WITH THE BODY OF THE UTERUS BY ABDOMINAL HYSTERECTOMY.

Anterior aspect.—A large ectopic sac is seen at the left cornu. The hypertrophied round ligament (1) is inserted directly on to the sac; to the outer side at (2) is seen the stump of the left tube and ovarian vessels; (3) is the normal right round ligament; (4) decidua projecting from the internal os at the level of amputation.

which led into the cavity of the uterus. The whole uterus measured six inches and a quarter in length. The width between the Fallopian tubes was about five inches. The fœtus removed was exactly eight inches long.

In another recent case * of interstitial gestation with acute symptoms—at about the fourth month—I removed the uterus

* See *Proc. Roy. Soc. Med., Obst. Section,* vol. iv. No. 4, p. 154.

with the gestation sac, and the patient made a good recovery. (See Figs. 206, 207.)

Diagnosis and treatment.—Before rupture of the tube it not infrequently happens that there are absolutely no

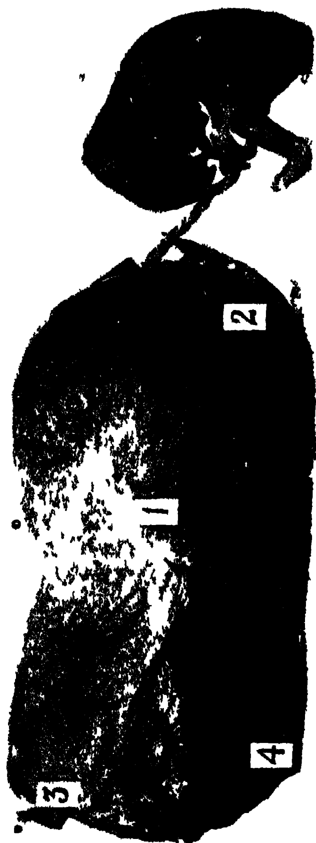


FIG. 207.—INTERSTITIAL GESTATION.

Anterior aspect.—The gestation sac has been opened at its thinned out apex, traversing placental tissue. A well developed fœtus (of three to four months), connected by its umbilical cord to the placenta on the inner surface of the sac, is seen outside an artificial opening made in the sac. The sac was about the size of two fists. Reference numbers as in preceding figure.

symptoms leading the patient to seek advice, so that no opportunity is given of making a diagnosis. In the first case just described—a typical example of interstitial gestation—there were no symptoms of anything being wrong, and the

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patient thought herself five months advanced in a normal pregnancy when the fatal rupture occurred.

Still, in some cases there are symptoms; and these, in conjunction with certain physical signs, to be more particularly referred to immediately, will sometimes enable us to make a shrewd guess at the cause.

The symptoms that may be expected are symptoms common in early pregnancy, uterine or extra-uterine: as pains in the breasts and morning sickness; menstruation may be completely absent, as in normal pregnancy (it was so in the case of interstitial gestation referred to above), or there may be more or less irregular hæmorrhages. Most frequently the patient goes a week or two over her time without menstruating, and then some bleeding occurs. In a considerable minority of cases bleeding occurs within a short time of the last proper menstrual period—that is, well before another period is due. Colicky pain in one or other iliac fossa is another symptom of some significance. Perhaps a decidual cast of the uterus may be discharged.

If a patient were to come with the symptoms referred to, and if, in addition, we found the vagina and vaginal portion of the cervix bluish, the cervix enlarged and soft, the os uteri patulous, and the uterus somewhat enlarged, and perhaps less movable than normal; and if, besides, bimanually a swelling were to be detected in the pelvis, especially to one side, and if also there were pulsation to be felt in the region of the swelling; if also there were changes in the breasts, and if the patient were over twenty-five and had never been pregnant, or, at all events, some considerable time had elapsed since the last pregnancy—the probability of the presence of an unruptured extra-uterine gestation sac would be sufficiently strong to warrant an exploratory abdominal section; and if an ectopic fœtation were found, it could be removed.

I have once had the good fortune to meet with a case of this kind; and having made the diagnosis of tubal pregnancy, I operated on it successfully before rupture of the tube had occurred. The case was recorded in the *Lancet* (1895, vol. i., p. 858), and the notes are as follows:—

Case of Tubal Gestation, diagnosed before Rupture. Operation: Removal of Fœtus and Sac. Recovery.

L. W., a married woman, aged 34, was admitted into Davis Ward of the London Hospital on February 24, 1894, complaining of severe pain in the back and left iliac region.

Family history.—Her father and mother both died of "fits"; two sisters and one brother are living and healthy. There is no history of tubercle.

Personal history.—She was married at the age of nineteen, and had had two children. The first child was born ten months after marriage, and died in eight days. The second child was born fourteen years ago, and is still living. Both confinements were easy. Seven years ago she had had one miscarriage when two months pregnant. She had done no work beyond her housework.

Catamenia appeared at thirteen, had been regular every four weeks, and normal in amount and colour up to two months ago, since when she had seen nothing. She menstruated regularly while suckling.

Present illness.—This began about January 1, 1894; she then felt very sick, retching, but not actually vomiting. About this time she had severe pain starting in the left iliac region, extending to the back, and going across to the right side of the abdomen. She remained in Bromley Sick Asylum from January 19, for three weeks, but obtained no relief. A week later she came to the London Hospital, and was admitted. The pain in the lower abdomen had been felt throughout; it appeared constant, not worse at night than in the day, and it did not shoot down the thighs, but was particularly severe when patient went to stool. On February 12, she first noticed a discharge, slight in quantity at first, of a reddish-brown colour, and not offensive. This had continued up to the present time. It had not increased in quantity, and as regards colour it had remained the same. She thought she was sometimes bigger in the left iliac region than at other times, but she had not herself noticed any definite swelling. She felt sure her breasts had been getting bigger lately. She was sick at times, the sickness occurred at night and during the day, without any relation to meals. No pain was felt in the vagina, but there was considerable pain in the "back passage."

State on admission.—She is rather pale, but there is no marked anæmia. The pulse is 70, and regular; the tongue is clean and moist; the bowels are not confined; and the temperature is normal. Urine is acid, amber, s.g. 1022; it contains no albumen or sugar. On abdominal examination nothing abnormal can be felt. On vaginal examination the uterus is found to be distinctly enlarged, apparently uniformly; the cervix is soft and blue; the uterus is freely movable; the sound passes $3\frac{3}{8}$ inches, with the curve forwards. A swelling about the size of an orange, but less regular in outline, occupies the left side of the pelvis: this swelling has a fair range of mobility. The breasts are firm; on

both sides fluid can be squeezed out—that on the left side is distinctly milky.

Progress, March 5—She is quite definite in her statement that she was regular up to Christmas, 1893, when the last menstrual period occurred. The quantity was slight, the period lasting three days; previously the period usually lasted seven days. She is under the impression that the breasts were larger in January than now. Since Christmas she had had severe pain occasionally in the left side, which resembled

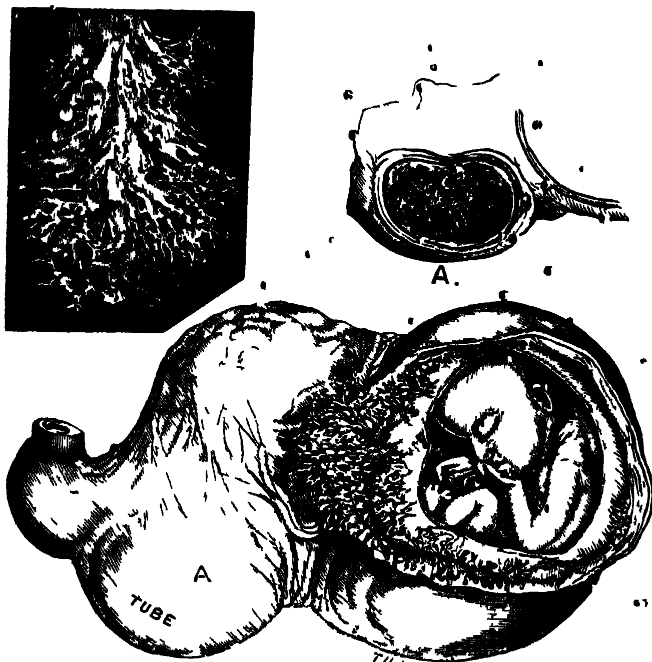


FIG 208—TUBAL GESTATION (Case of L W) DIAGNOSED AND OPERATED ON BEFORE RUPTURE

The lower figure represents the Fallopian tube removed with the ovum. The upper figure to the right shows the swelling A in the lower figure, cut across; it is due to a detached portion of the placenta developing in that part of the tube. Above and to the reader's left is a drawing of one of the loose pieces of placental tissue that came out on the sponges

labour pains, lasting two hours. She had had two intervals of a week without pain

A diagnosis of unruptured tubal pregnancy was made, and operation advised.

Operation, March 8—The abdomen was opened in the usual way. No blood was seen on opening the peritoneal cavity. The uterus early

came into view, of purplish-red colour; it was considerably enlarged, feeling pulpy, and suggesting a pregnant uterus. On passing the hand down to the left side of the pelvis a swelling was felt, about the size of an orange, which burst on attempting to draw it out, and a fœtus (about three months) was, so to speak, shot out of the wound, a little clear fluid escaping at the same time. The Fallopian tube was held up, the broad ligament was transfixed and tied with the Staffordshire knot, and a single ligature was passed round the whole pedicle. The tube was then cut away. One or two separate pieces of placenta about the size of a penny came up on sponges as the peritoneal cavity was sponged out (one of these is figured above). The wound was completely closed without drainage. The patient made an uneventful recovery.

As to the diagnosis at the time of rupture of the sac, this will usually be sufficiently clear, if the rupture takes place into the peritoneal cavity. The patient will be *suddenly* seized with severe pain in the abdomen, and will probably soon show the usual symptoms of serious internal hæmorrhage. This will be quite enough to warrant an immediate exploratory operation; if it appears that the condition of the mother is very unfavourable, this may be met by injecting 1–4 pints of normal saline solution into a vein at the same time as the abdominal section is being performed. I have had this done several times in such cases with good results. It must be admitted, when the question of operation is being considered, that undoubtedly many cases left to nature recover, since typical cases of pelvic hæmatocele (now known to be due to extra-uterine pregnancy) often recover. At present, however, we cannot distinguish between those cases that will get well under expectant treatment, and those in which fresh intra-peritoneal bleeding is going to take place. In deciding the question of operation, therefore, much depends on the circumstances of each case. If the patient is under observation in hospital, where she can be operated on without much delay should fresh intra-peritoneal bleeding occur, there is no harm done in watching the progress of the case for a time.

On the other hand, when the patient is so placed that there would necessarily be much delay before an operation could be performed, it is better to operate as soon as the nature of the case is recognised.

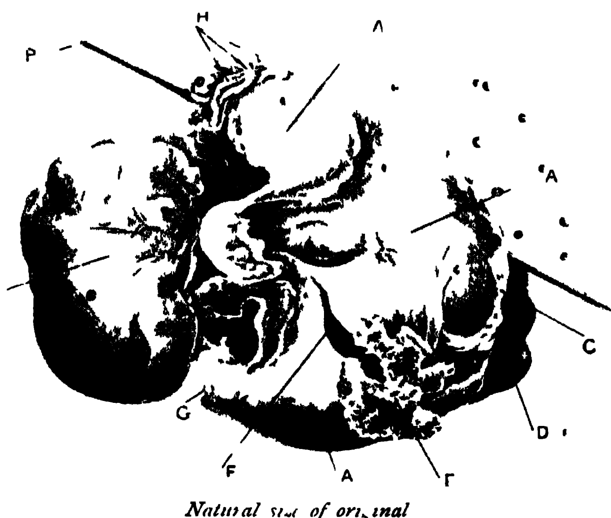
Furthermore, remembering that an absolutely correct

diagnosis as to what is within the abdomen is far from being always possible, and particularly that many cases diagnosed as ectopic pregnancy have proved to be cases of pyosalpinx, and *vice versâ*, the best treatment seems to me to be to operate in all cases in the category under consideration.

The following case was one in which a tubal mole caused an intra-peritoneal rupture of the tube —

Tubal Mole Intra-Peritoneal Rupture, with Profuse Hæmorrhage Abdominal Section. Recovery.

Mrs C., 34 years of age, who had been married eleven years, was seen by me in consultation with Dr R. Ambrose, on March 19, 1896, at



Natural size of original

FIG 209 —TUBAL MOLE (Case of Mrs C) THE RUPTURED TUBE (right) AND CORRESPONDING OVARY REMOVED.

A Dilated Fallopian tube C Cut edge, where tube has been opened after removal, the dark portion (D) to the right is the mole E. Fringes of placental tissue projecting through the rent (Γ) that occurred spontaneously. G Narrow end of Fallopian tube, where it was cut off at the operation O Right ovary P Probe passed through fimbriated end of tube, which was open H Fimbriæ

3.30 p.m. She had had two children, the last six years ago, both her confinements were quite natural She had had one miscarriage at about the sixth or eighth week four years ago. She got up immediately after the miscarriage, but went back to bed two days afterwards, and remained in bed for six weeks. She was then admitted into a hospital, and re-

mained there for six weeks longer on account of what she was told was peritonitis. As regards her present illness, she had menstruated regularly every four weeks till about two months previously. January 25 was the last day of the last period. From that time she "saw nothing" until March 19, the day on which I was called in to see her. For two weeks previous to this date she had had constant pain in the right iliac region, and several attacks of slight faintness, but she had not been obliged to keep in bed. On March 19, when she got up, while she was dressing she was seized with severe pain in the right iliac region, accompanied by a severe attack of faintness, and she had to be assisted back into bed. At this time she had a slight loss of blood, this being the first occurrence of any hæmorrhagic discharge since the last menstrual period (January 25). I saw her for the first time at 3.30 p.m. on March 19, when the particulars of the case already given were obtained. The patient at that time was extremely pale, the pulse was 108, and there was a marked tendency to



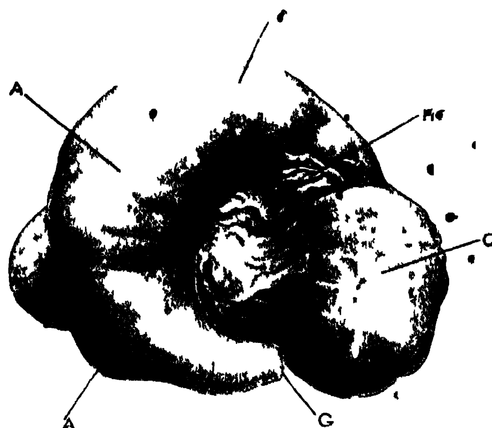
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FIG. 210.—RIGHT FALLOPIAN TUBE LAID OPEN ABOVE (Case of Mrs. C.).

D. The mole. E. Part of the same, consisting of spongy tissue protruding through the rent that occurred spontaneously. C C. Cut edges of dilated Fallopian tube. G. Inner end of tube.

syncope on the slightest exertion. It happened that the head of the bed was towards the window, and, in order to make a more satisfactory examination, I had the patient moved so that her head was at the foot of the bed. While doing this she almost fainted away, the pulse stopping for a few seconds On examining the abdomen there was some fulness about the hypogastric region, and an indistinct sensation of a swelling there and in the right iliac region. But the lower abdomen was extremely tender, so that no very complete examination could be made. On vaginal examination, there was a little recent blood in the vagina, the uterus was distinctly less movable than normal, and there was an indistinct swelling

to the right of it. The breasts had an active appearance. It appeared to me that the case was one of ruptured tubal pregnancy, and as the surroundings of the patient were somewhat inconvenient in the event of operation I had the patient removed in an ambulance to the London Hospital I saw her again at 9 p m on the same evening, her condition then was decidedly worse than when I had seen her earlier in the afternoon, the pulse especially was weaker and more frequent It had been 108 in the afternoon at half-past three, whereas at nine o'clock it was 120 and decidedly smaller I thought that abdominal section was the right procedure, and the patient and her friends readily agreed that it should be done On opening the abdomen, there was a large quantity of blood free in the peritoneal cavity, on passing the hand down to the right, the right tube was drawn up to the wound, and was seen to be considerably



Natural size of original

FIG 211—THE UTERINE APPENDAGES OF THE LEFT SIDE, ALSO REMOVED AT THE SAME OPERATION (Case of Mrs C)

A Left Fallopian tube, dilated and containing blood clot (hæmatosalpinx); H Traces of fimbria belonging to the outer end of the tube, which was closed, O Left ovary, G Inner cut end of tube

enlarged There was a rent in it somewhat anteriorly, from which a spongy substance was protruding, at this point bleeding was still going on. The uterine appendages on the right side were then removed in the usual way, the uterus was observed to be considerably and uniformly enlarged, and indeed, as one has observed in several similar cases, had very much the appearance of the pregnant uterus On examining the appendages on the left side, it was found that these were by no means normal, for the left Fallopian tube was considerably dilated, being an inch or more in diameter, and accordingly I also removed the appendages on the left side. The abdomen was washed out with warm saline solution repeatedly, till all

PLATE XI.



SECTION OF TUBAL MOLE SHOWING CHORIONIC VILLI CUT ACROSS TRANSVERSELY OR SOMEWHAT OBLIQUELY.

From case of Mrs C (High power.)

PLATE XII.



SECTION OF TUBAL MOLE SHOWING CHORIONIC VILLI CUT ACROSS TRANSVERSELY OR SOMEWHAT OBLIQUELY.

From case of Mrs C (Low power)

the clot and blood which had been effused seemed to have been washed away. A Keith's tube * was inserted, and the rest of the abdominal wound closed in the usual manner. The patient made an uninterrupted recovery; the temperature after the operation was only once above 101° F., and that on March 22. I saw this patient on March 28, when she came to report herself at the Hospital; she was then quite well, and the abdominal wound was soundly healed.

On examining the appendages removed, there was a large corpus luteum in the right ovary about three-quarters of an inch in diameter; the right tube had, as already mentioned, ruptured anteriorly, and from the rent a small portion of spongy tissue was projecting. Subsequent examination of a section of this spongy tissue showed that it contained an abundance of chorionic villi. (See Plates XI. and XII.) The tube itself contained a hard clot, which, before the tube was opened, felt as if it



Natural size of original.

FIG. 212.—LEFT FALLOPIAN TUBE, DILATED AND CONTAINING BLOOD-CLOT (Case of Mrs. C.).

G. Inner end of tube; C C Cut edges of dilated tube where it has been laid open. The walls of the dilated tube are thin, and the clot is not adherent to the inner surface of the tube

might have been a fœtus; but no fœtus was found. The fimbriated extremity of the right tube was open. The left Fallopian tube, which was considerably dilated also, was found on section to contain a firm blood-clot, not attached to the inner surface of the tube. The wall of the left tube was extremely thin, very much thinner than the wall of the right Fallopian tube. The left ovary was somewhat large, but contained no corpus luteum. The fimbriated extremity of the left tube was closed.

* I have long given up employing drainage in these cases, and find the results quite as good.

The following case is an example of tubal gestation with intra-peritoneal rupture at about the third month :—

Mrs. N., a married lady, aged 28, was seen by me in consultation on April 1, 1893. Her history was as follows :—She had been married twice —the second time a year and eight months ago. She had had one confinement seven or eight years ago, and was said to have had three miscarriages since her second marriage. She came on "poorly" on January 5, 1893, instead of the 13th, which would have been the proper time. Her husband left her on January 28, and was away till March 25. She menstruated again on February 9, and, except for an interval of two days, she had a red vaginal discharge from that time till I saw her in April. Pain in the right iliac region had been a symptom from about the beginning of March. On April 1, at 3 a m, she was seized with severe pain in the "stomach" and back, and felt faint and sick. I saw her about 5 p.m. the same day; she was in bed, but she had rallied a good deal since the early morning, and was able to tell me most of the history that has been given above. The breasts had an appearance of activity, and contained milk; she was sure they were larger than they had been. An indistinct fulness could be felt in the hypogastrium, but tenderness interfered a good deal both with this and with the subsequent vaginal examination. The vagina and cervix had a distinct blue tinge. The uterus was considerably enlarged, and there was a soft swelling, with an indefinite outline, to the right of the uterus. It seemed to be very probable that the case was one of extra-uterine pregnancy, although it was possible to explain the various features of the case by supposing it to be one of threatened miscarriage or molar pregnancy; on that supposition the swelling to the right would be an accidental complication such as a small ovarian tumour or dilated Fallopian tube. Soon afterwards the patient was removed to a nursing-home. I was again sent for to see her on April 17, about 6 p.m., as she had been once more seized with great pain in the right iliac region and faintness. The red discharge had persisted more or less. I advised that she should be examined under chloroform, and that the cervix should be dilated, so that the condition of the interior of the uterus might be ascertained. This was accordingly done on the next day. I found the uterus to be uniformly enlarged, and its cavity empty. The sound passed four inches. The interior of the uterus was soft and pulpy; there was nothing to account for its enlargement except the view that the swelling felt to the right of it was an extra-uterine fœtation. At this time the patient was extremely anæmic; the abdomen was moderately distended and tender. I advised abdominal section, and it was arranged to perform it on April 22. Between the 18th and the 22nd the distension of the abdomen increased somewhat, but it was never extreme; there was great pain, especially marked in the right iliac region. The pulse was 104, and there was no rise of temperature. Morphia and hot fomentations were used in order to relieve the pain.

The operation was undertaken on April 22, at 10.30 a.m. On opening the abdomen the peritoneal cavity was found to contain a large quantity

of blood and clot. Some of the clot was more recent than other portions. The fluid blood was dark and of a somewhat chocolate colour. A fœtus of about three months' development was found to be lying among the intestines; the umbilical cord was ruptured about two inches from the fœtus, but I am not sure whether this may not have been accidentally done when exploring the condition of things with the hand in the first instance. The right Fallopian tube was found to have been the seat of the pregnancy. It had ruptured towards the outer part and anteriorly; there was a second rupture more posteriorly, out of which a shaggy piece of placenta, the size of half a walnut, projected into the peritoneal cavity. There was no evidence whatever of peritonitis, there being no lymph, and the surface of the peritoneum everywhere was smooth and shining. The ruptured sac was held up, and the broad ligament below it was transfixed and tied. Another ligature was then tied round the whole pedicle, and the sac was cut away. The peritoneum was then washed out very thoroughly with hot iodine water, containing one drachm of the tincture to each quart of water. About twelve jugfuls of this were used. After about five jugfuls had been used, and the lower part of the peritoneum seemed to be quite clean, a large quantity of dark blood came from the region of the liver, having been shut off from the effect of the previous washing by the left hand holding back the intestines. Finally, the water used for washing came back quite clean, and the wound was completely closed in the usual way.

The subsequent progress of the patient was as follows:—Convalescence was delayed much longer than is usual in uncomplicated cases of abdominal section, such as ordinary cases of ovariotomy. The sutures were taken out a week after the operation, *i.e.*, on April 29, and the wound was found to be completely healed. This was about her worst day; she was very restless and excitable. At 8 p.m. on that day her pulse was 140, and the temperature 102·8° F. She had slight hiccough and retching, bringing up a little dark bitter fluid into her mouth, but there was no actual vomiting. On May 3, there was swelling of the right submaxillary and parotid glands, which persisted for some days, but afterwards disappeared without suppuration taking place. On the 7th the wound spontaneously reopened at the lower end, and a good deal of thin blood-stained fluid came away. On the next day the discharge became more purulent. The probe passed two inches at the lower angle of the wound, and a small drainage-tube was inserted there. This was gradually shortened from time to time, and was finally discontinued on the 19th. The temperature was highest in the third week after operation, when it reached 104° on three occasions. It was during this week that the wound broke down at the lower end as already mentioned. On June 12 the patient was allowed to sit up for three hours, and on the 15th she went for a drive. On the 18th there was some yellow discharge from the vagina, which continued for some days. On the 22nd she left London to visit her mother; at that time there was still a small sinus at the lower angle of the wound. After an absence of two months she returned to London and came to see me; the sinus had been for some time closed, and when I

examined her there was a sound cicatrix in the situation of the wound. She had completely regained her ordinary health.

An interesting point about this case is that about a year afterwards she suffered from somewhat similar symptoms, and a diagnosis of tubal gestation was again made, and abdominal section decided on. The day before the proposed operation the patient passed a blighted ovum the size of a hen's egg from the uterus, which had been known to be enlarged. The operation was undertaken as arranged, and the swelling to the left of the uterus which had been thought to be a tubal gestation was found to be a small ovarian tumour about the size of a cocoanut. It was removed, and the patient made a good recovery. Some portion of the left ovary (which was degenerated so as to form the cyst) must nevertheless have furnished the ovum, which formed the blighted ovum discharged from the uterus the day before the operation. The case is interesting also as an instance of two abdominal sections on the same patient.

Another case, interesting as one of tubal abortion (threatened), is the following:—

Tubal Mole. *Threatened Tubal Abortion, with Intra-Peritoneal Hæmorrhage from the Open Fimbriated End of the Tube. Laparotomy: Removal of the Dilated Tube. Recovery.*

S. M., aged 28, was admitted into the London Hospital under my care on March 24, 1894. She had been married two years and a half, but had had no children or miscarriages.

History of the present illness.—She said her illness started at the beginning of March with pain in the left iliac region, which had steadily increased in severity up to the time of her admission. She thought there was a lump in the side where she felt the pain.

Menstrual history.—She menstruated first at the age of thirteen, and had always been regular every month up till a week before Christmas, 1893, when the last proper period occurred.

On March 10, 1894, she passed something "like a piece of flesh," and, about an hour afterwards lost a good deal of blood. More or less metrorrhagia continued till she was admitted into the Hospital.

On examination then the breasts presented an active appearance, and contained milk. The uterus was distinctly and uniformly enlarged, and was soft. The cervix was blue and soft. There was a swelling the size of a Tangerine orange felt in the left side of the pelvis. The temperature and pulse were normal.

PLATE XIII.

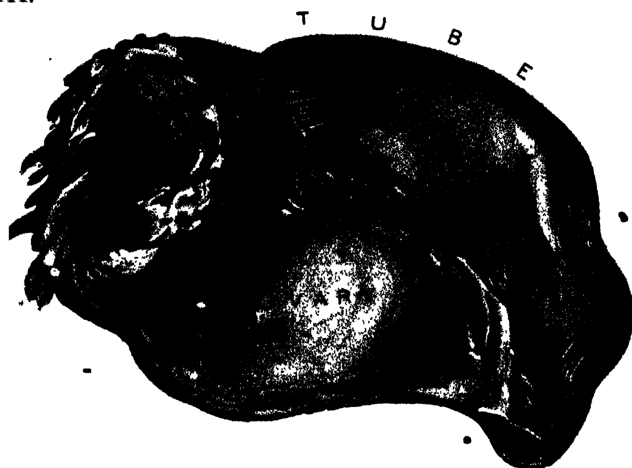
REPEATED ECTOPIC PREGNANCY IN THE SAME PATIENT. (S. M.)

The drawing shows the parts removed at the second operation.

A. The right Fallopian tube and ovary. The fimbriated end of the tube is widely open, and through it the mole (C) had either just been naturally expelled before the operation, or, more probably, was extruded by handling the tube in the course of the operation.

B. The ovary cut across, showing the large corpus luteum.

PLATE XIII.







Taking all the points of the case into consideration, it seemed very probable that the case was one of tubal pregnancy, and I advised abdominal section, to which the patient consented.

Operation, March 27, 1894.—The patient walked to the operation table. After she was anæsthetized she was placed in Trendelenberg's position. On opening the abdomen there was no blood diffused in the general peritoneal cavity; but when the intestines were held out of the way a mass, estimated at a teacupful, of recent "currant-jelly" clot could be seen in the left posterior quarter of the pelvis. The uterus was considerably enlarged, and was very soft; it presented the bluish-red colour seen either in the ordinary pregnant uterus, or in the uterus when sympathetically enlarged in cases of extra-uterine pregnancy. To the left of it was the swelling referred to above, which proved to be the left Fallopian tube. This was held up, and the broad ligament below it transfixed and tied with the Staffordshire knot; another ligature was then tied round the whole pedicle, and the tumour removed. The peritoneum was washed out with several jugs of weak iodine water, and a Keith's tube having been inserted in Douglas' pouch, the rest of the wound was closed in the usual way.

As regards the specimen, the tube had not ruptured, and the fimbriated end of it was open. The clot seen in the pelvis had evidently come from the tube through the open fimbriated extremity.

The patient made an uninterrupted recovery, and was discharged on April 17.

It should be remembered that occasionally after a successful operation for tubal gestation with acute intra-peritoneal hæmorrhage, the patient may, after a longer or shorter interval, have another ectopic gestation on the opposite side with similar acute symptoms, necessitating a second abdominal section. I have met with at least six such cases, in which I have had to operate a second time. The patient S. M., whose case, as regards her first ectopic pregnancy, has been just recorded, is one of them. She became pregnant with a second ectopic gestation, this time on the right side, early in 1900. On May 12 she was acutely ill, and I operated, removing the parts shown in Plate XIII. (A, B, C). She made a good recovery. This patient, though she twice became the subject of a tubal pregnancy, had never had a uterine pregnancy. Sections of the mole (C) showed numerous chorionic villi.*

* *Trans. Obst. Soc. Lond.* vol. xlii. p. 324.

A Successful Case of Intra-Venous Injection of Salt Solution after Laparotomy in a Case of Ruptured Tubal Gestation.

On April 20, 1896, I was called in by Dr. Fennell, of Dalston, to see Mrs. F. F., aged 30 years, when the following history was obtained:—She had been married nine years, and had had four children, the last nineteen months previously. There had been no miscarriages. Instruments were used at the first confinement, but not at the others. She generally got up ten days after her confinements, but after the last confinement she was in bed nearly two months on account of what the medical attendant told her was peritonitis. Menstruation was quite regular up to February 26, 1896, but she "saw nothing" in March. She took some pills on April 4 with a view to bringing on the period; these gave her great pain. On April 6 a vaginal discharge containing blood began, and she had been losing blood more or less ever since up to the day when I first saw her (April 20). The patient said that a solid substance came away from the vagina on April 11 when passing urine. She had had some pain in passing urine, and had suffered from constipation since April 6. She said that she had had pain at the lower part of the abdomen, especially over the left iliac region, for some days before I saw her, and there was an especially sharp attack of pain on the early morning of April 20. On examination of the abdomen there was some resistance in the left iliac region, and some tenderness there. The breasts did not appear active. On vaginal examination there was a little blood to be seen about the external parts. The uterus was anteverted and slightly flexed, and distinctly larger than normal, although the sound only passed three inches. A swelling was felt behind and to the left of the uterus, occupying the left posterior quarter of the pelvis. It was distinctly elastic, and could be displaced a little by upward pressure. The case appeared to me to be in all probability one of extra-uterine pregnancy. The question arose as to whether the substance passed by the patient a few days before I saw her might not have been an ovum, and the case one of ordinary miscarriage, with possibly some peri-uterine inflammation; but, on the whole, it seemed to me much more probable that the case was really one of tubal pregnancy, and that the substance in question said to have been passed, if anything more than a clot, was probably a decidual cast of the uterus. The arrangements at the patient's home were not very convenient for performing abdominal section, and accordingly I had her removed to the London Hospital, where she was admitted under my care on April 21.

Operation.—On April 23 she was anæsthetized with the A.C.E. mixture; the abdomen was opened in the usual way, and was found to contain blood and masses of clot. The left Fallopian tube was considerably enlarged, and had ruptured. The left ovary contained a large corpus luteum with a well-marked yellow convoluted border. The uterine appendages on the right side were also slightly enlarged, and the uterus was considerably enlarged. The appendages on both sides were removed

in the usual way, and the peritoneum well washed out with saline fluid. A Keith's tube was inserted, and the rest of the abdominal incision was closed. When this had been done, it was observed before the dressing was put on that the Keith's tube had become full of dark blood. This was withdrawn once or twice, but the tube very soon became again full of blood. The abdomen was therefore reopened to discover the source of the bleeding; the stumps of the broad ligaments were pulled up and inspected, but no blood was coming from them. On looking at the back of the uterus there were some quite superficial tears in the peritoneal coat near the level of the internal os, from which blood was coming rather freely. Several attempts were made to control this bleeding by passing silk ligatures on a curved needle under the tissues at the bleeding point and tying, and also by applying Wells' forceps; but the tissues were so friable that the more manipulation took place in the neighbourhood of the tears the worse the bleeding became. I therefore decided to perform supra-vaginal hysterectomy; the uterine arteries were ligatured on each side outside the uterus, and then the body of the uterus was cut away. A large pair of Wells' forceps was left on, but the surface of the stump oozed rather freely, and two silk ligatures were passed right and left from before backwards and tied firmly to check it. Some iodoform gauze was packed over the stump, a small piece being left sticking out at the lower end of the wound. A Keith's tube was inserted, and the remainder of the wound closed in the usual way. The reopening of the wound and the various measures that were required to permanently control the bleeding had occupied a considerable time, and, besides, a good deal of blood had been lost, taking into consideration what was extravasated in the abdomen by the extra-uterine sac before operation, and also reckoning the amount that was lost from the superficial tears on the back of the uterus. How these were produced I am unable to say positively. My impression is, however, that some of the masses of clot removed were partially adherent to the uterus, and that in removing them the peritoneal coat of the uterus must have been slightly torn, and then the tissues were so friable that almost any kind of manipulation—sponging, pulling up the uterus, and the like—seemed to increase the laceration and the hæmorrhage. At all events, at the end of the operation, when the patient was put back to bed, her face was quite white, her hands and feet quite cold, and no pulse could be felt at the wrist; and I have no doubt whatever that, had she been left without further treatment, she would have died, probably without regaining consciousness at all. I decided, however, to try the effect of injecting salt solution into the veins. Our stock of boiled water had been exhausted in washing out the abdomen during the operation, so that the water used in making the salt solution for intra-venous injection was merely the water out of the kettle and out of the tap. The salt solution, however, was sterilized, because we keep a concentrated solution of it, which is carefully prepared and boiled before each operation. A glass reservoir was filled with salt solution at the temperature of 100° F., and containing a drachm of common salt to each pint. The injection was made into the median cephalic vein of the left arm, the necessary pressure

being obtained simply by hanging up the glass reservoir on the wall about three feet above the patient's head. After one pint had been injected the patient's pulse at the wrist could be felt. After four pints had been injected the pulse was as good as it had been before the operation. The patient made a good recovery. I have seen her several times since she left the Hospital; the abdominal wound is soundly healed, and she remains quite well.

As regards the treatment to be adopted in advanced cases of extra-uterine gestation at, or near, or past the full time of gestation, the right course will generally be to operate. As to the time for interference, as the fœtus, even when alive, is almost always imperfect in some way, and little likely to survive in any case, the operation should be performed at the time when all the conditions are likely to be the most favourable for the mother. This is some weeks after the death of the fœtus. If the operation is undertaken when the fœtus is living, it will be wise not to interfere with the placenta: this is especially so when the placenta is in the pelvis below the fœtus. Any attempt to remove the placenta will probably lead to uncontrollable hæmorrhage. The cord is cut short close to the placenta, and the edges of the sac stitched to the abdominal wall: a drainage tube is inserted into the sac. The placenta will come away piecemeal after a considerable time. This is probably the safest course. It has also, however, been suggested that the cord be tied and cut short close to the placenta, and that the abdomen should be closed without drainage, in the hope that the placenta will become absorbed. After the death of the fœtus the placenta may probably be removed without any great risk at the same time as the fœtus.

CHAPTER XVI.

DISEASES OF THE OVARIES.

OVARIAN TUMOURS.

TUMOURS of the ovary may be divided into :—

1. *Solid*, and
2. *Cystic*.

1. **Solid ovarian tumours.**—All solid tumours of the ovary are comparatively rare.

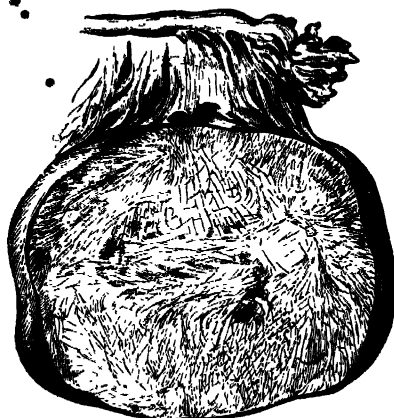


FIG. 213.—MYOMA OF THE OVARY (Doran).

Malignant solid tumours are either sarcomata, or carcinomata. There is generally a good deal of free fluid in the peritoneum in cases of malignant ovarian tumour. (See p. 216 for case of ovarian tumour for the most part solid.)

Non-malignant solid tumours are either fibromata, fibro-myomata, or myomata (Fig. 213). The greater number

are fibromata.* The growth in these may either produce a general enlargement of the affected ovary, or it may affect only part of it—generally the outer part. In such cases the unaffected portion of the ovary can be recognised—generally at the inner end of the tumour. Occasionally an ovarian fibroma takes the form of a more or less pedunculated projection from the ovary. In all these cases there may, or may not, be free fluid in the peritoneal cavity. In several cases of this kind of tumour in which I have operated, it has happened that there has been no free peritoneal fluid.

Ovarian fibromata are subject to the same kinds of



Natural size of original.

FIG. 214.—SMALL MULTILOCULAR OVARIAN TUMOUR.

B B B. Irregular projections due to separate cysts. A. Indicates where the tumour was cut off after the pedicle had been tied. (From a case of the Author's.)

degeneration as uterine fibromata. For instance, in a case in which I removed a typical ovarian fibroma the size of a cocoa-nut, the growth had produced a uniform enlargement of the ovary, and the tumour had undergone calcareous degeneration in many places, chiefly on the surface. There was no free fluid in the peritoneum; and there were no adhesions. The patient made an uneventful recovery.

* For further information on this class of tumour, see a paper by Dr. Fairbairn, "Fibroid Tumours of the Ovary," *Trans. Obst. Soc. Lond.*, vol. xliv., p. 177.



FIG. 215.—SOLID CARCINOMA OF THE OVARY, WITH EXTENSION OF THE DISEASE TO THE INTESTINAL AND PARIETAL PERITONEUM, AND TO THE OMENTUM (Dudley).

2. **Cystic ovarian tumours.**—These may be classified as follows:—

1. *Follicular cysts.*
2. *Lutein cysts.*
3. *Proliferating glandular cysts* (cyst-adenomata).
4. *Proliferating papillary cysts.*
5. *Dermoid cysts.*

1. *Follicular cysts.*—These are due to a dropsical distention of Graafian follicles, which for some reason have not undergone maturation and rupture in the normal way.

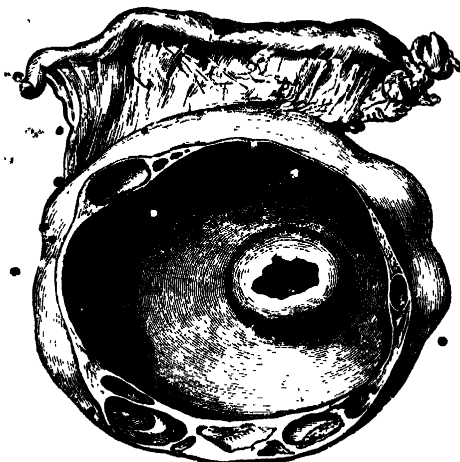


FIG. 216.—SMALL MULTILOCULAR OVARIAN CYST, SLIGHTLY REDUCED FROM NATURAL SIZE (Doran).

The Fallopian tube and its fimbriated extremity are seen at the upper part of the figure.

When still small, each cyst is lined by cells identical with those of the membrana granulosa; as the cyst enlarges, the cells lining it become first flattened, and may, at a later stage, disappear. The "tumour" of the ovary resulting from the process described rarely attains a large size, and is multilocular. Occasionally the septa between adjacent cysts may become broken down, so that the number of cavities becomes less than the number of cysts originally affected by the degeneration. These cysts contain clear, watery, straw-coloured fluid.

The form of degeneration described is not that which leads to the production of the common multilocular ovarian cyst.

It seems probable that follicular cysts have an inflammatory etiology. The tissues on the surface of the ovary become hardened by inflammation, and may so prevent the Graafian follicles from rupturing. A dropsical distention of



FIG. 217.—SECTION THROUGH OVARY, SHOWING AN INVOLUTING CORPUS LUTEUM. (*Micro-photograph.*)

The crenated outline of the lutein cell-layer is seen bordering a cavity, the site of the ruptured Graafian follicle. Specimen taken from a left ovary disorganised by presence of many retention cysts. The right ovary formed a very large adenomatous cyst containing 300 ounces of fluid.

the follicles then takes place, leading to the production of follicular cysts. The fact that, in many operation cases where the Fallopian tubes are inflamed, dilated, and adherent, we find a moderate cystic enlargement of the ovaries lends further probability to this view.

Where the Fallopian tubes are extensively diseased as the result of inflammatory action—in cases of hydrosalpinx and pyosalpinx—we practically never find the common multilocular ovarian cyst of large size containing the characteristic pseudo-mucinous fluid.

This fact alone, apart from other considerations, would lead one to suppose that the pathological process concerned in producing the cystic changes in the ovary so often found in association with inflamed Fallopian tubes is not that which leads to the formation of the common multilocular (pseudo-mucinous) ovarian cyst.

According to Doran, follicular cysts are distinguished on inspection from small multilocular ovarian cysts of the proliferating glandular kind by the fact that, in the former variety, "the cysts bulge from the free border of the ovary," while in the latter, "the ovary enlarges in a uniform manner."

2. *Lutein cysts.*—These are developed from the corpus luteum, and are unilocular. They do not attain a large size; the largest I have seen was about the size of a man's fist. The characteristic feature by which they may be recognized is the bright yellow layer in the cyst-wall due to the lutein cells. The reason why a corpus luteum undergoes cystic, in place of the normal retrogressive, changes is not known. There appears to be some causal relation between the presence of lutein cysts and the occurrence of hydatidiform degeneration of the chorion.

3. *Proliferating glandular cysts* (syn. cyst-adenomata; pseudo-mucinous cysts).—The mode of origin of these cysts is doubtful. Some observers consider that they are derived directly from the germinal epithelium, portions of which have in some way become accidentally included in the cortex of the ovary and have remained quiescent for a time; or, alternatively, that processes of the surface epithelium have grown down into the cortex. Subsequently this epithelium undergoes active proliferation, fluid is secreted, and so the cystic degeneration is started.

Others think that proliferating glandular cysts are derived from the Graafian follicles. Active proliferation of the epithelium lining the follicles takes place with free secretion of fluid.

The lining of these glandular cysts is formed by a single layer of high columnar epithelium. Further growth takes place by a dipping outwards into the cyst-wall of the glandular epithelium, forming first a diverticulum from the original cavity; the communication between the original cavity and that of the diverticulum becomes shut off, so that the diverticulum has become a separate cavity. This enlarges in its turn, and diverticula are similarly thrown out by its epithelial lining to become separate cavities as before. As the process may go on indefinitely, we can easily understand how it is that proliferating glandular tumours may reach an enormous size and weight, unless their progress is cut short by operation.

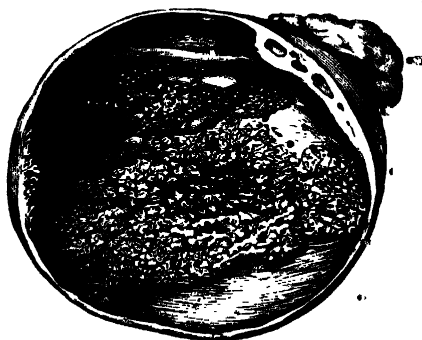


FIG. 218.—INCIPIENT PAPILLOMATOUS CYST OF THE HILUM OF THE OVARY. The free portion of the ovary projects above, posteriorly (Doran).

Cyst-adenomata contain a glairy fluid, which may be colourless, or yellow, green, reddish, or almost black. The fluid may be thin and watery, or it may sometimes be so thick that it will not flow through a canula. The fluid chemically contains pseudomucin; when the fluid is reddish, or dark and tarry, this is due to admixture with blood.

4. *Proliferating papillary cysts.*—It has been supposed that these arise from remnants of the Wolffian body in the hilum of the ovary; it appears, however, to be more probable that they arise, like the proliferating glandular cysts, from the germinal epithelium. It appears to depend on the activity of the epithelium lining the cyst-wall whether we merely have the cyst-adenomata described in the preceding section,

or whether, if the epithelial proliferation is still more active, papillary masses are formed on the interior of the cyst-wall.

Such cysts are usually unilocular, and they may develop so as to separate the layers of the broad ligament, and thus occupy a position between the uterus and the pelvic wall; or they may be pedunculated like the ordinary multilocular cyst. The papillary growths in the interior of such cysts are soft and friable, bleeding readily on manipulation, and having, as regards the naked-eye characters, much in common with the "cauliflower" growths found in cases of carcinoma of the cervix. These papillary masses may grow through the

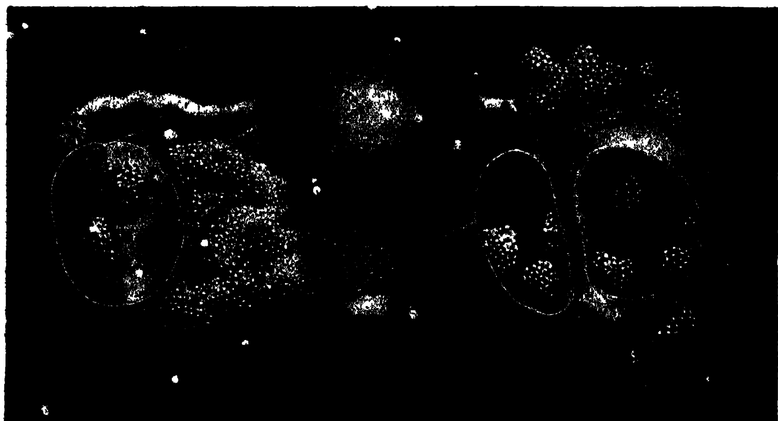


FIG. 219.—PAPILLOMATOUS OVARIAN DISEASE.

On the right side is a cyst from the vascular zone of the ovary. In the wall of this cyst have developed three secondary cysts, which are shown in section, and which contain warty growths. Observe also the warty growths both on the outside and the inside of the cyst. To the left is a superficial papilloma of the ovary, which lies between the ovary and the uterus. Papillomatous disease on the inside of this ovary is also shown in section. (Dudley.)

cyst-wall, and so protrude freely into the peritoneal cavity. As a result of this, similar papillary masses arise by implantation of cells in various parts of the peritoneal cavity. Such a condition is, then, clinically one of general malignant disease of the peritoneum. (See Fig. 219.)

These tumours are often bilateral, and, in contrast to the proliferating glandular variety, which may occur at any age, they are rarely found before the age of twenty-five.

5. *Dermoid cysts.*—Dermoid cysts of the ovary are characterized by the special characters of the lining of the cyst, and by the cyst-contents. The interior of the cyst is lined wholly, or partly, by a tissue similar to skin, having sebaceous glands, sweat-glands, hair follicles, and hair. Attached to the interior of the cyst-wall, teeth and portions of bone are often found. The cavity of the cyst is filled with an oily fat, which is fluid at the temperature of the body, but becomes partly solidified when the tumour is removed

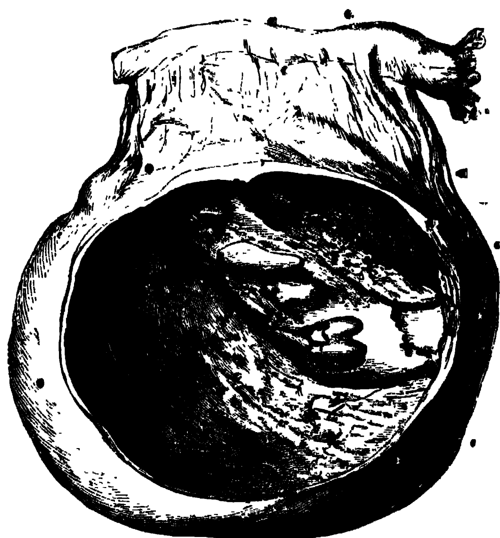


FIG 220.—DERMOID CYST OF THE OVARY (Doran).

into the outside air. A considerable tow-like mass of hair is generally found lying loose in the interior of the cyst. Dermoid cysts are unilocular, and may be found on one side only, or, exceptionally, on both sides. A loculus of what appears to be an ordinary multilocular ovarian cyst may on section be found to be a dermoid cyst.

The above account applies to the kind of dermoid ovarian cyst most commonly met with. Occasionally, besides containing the structures mentioned (skin, bones, and teeth), various other tissues (brain, muscle, nerve, &c.) may be present also. The tumour is then much more solid than

an ordinary dermoid, and may be clinically malignant. Such complicated ovarian dermoids are called teratomata: they are very rare.

As to the origin of dermoid cysts, a plausible suggestion is that they are produced by the development in an erratic

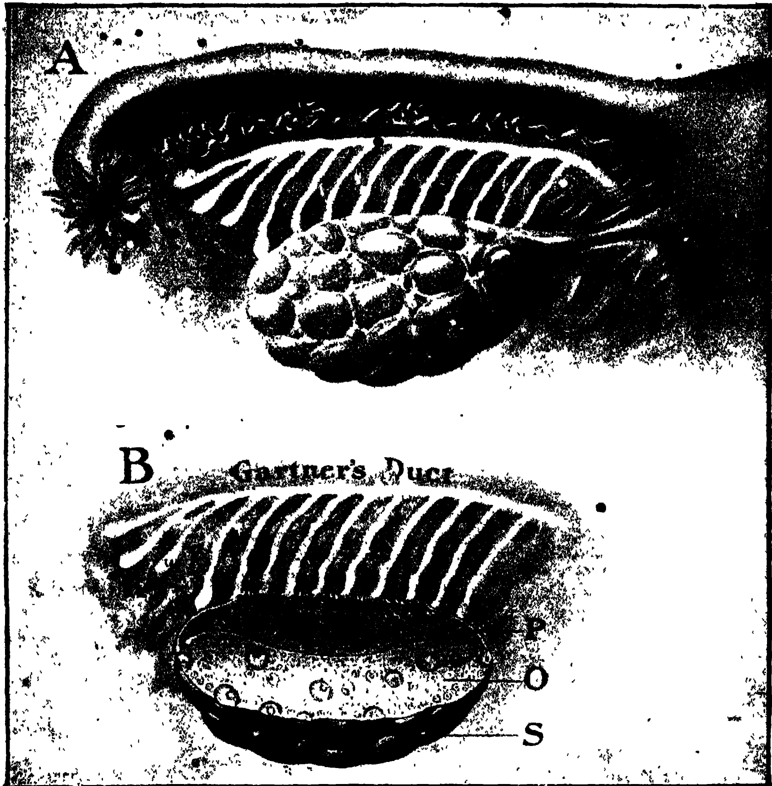


FIG. 221.—CYST-PRODUCING REGION OF THE OVARY AND ITS SURROUNDINGS (Dudley).

A. Uterus, Fallopian tube, parovarium, and ovary. B. Gartner's duct (remnant of Wolffian duct), parovarium (remnant of Wolffian body or mesonephros), and ovary shown in section. P. Vascular or medullary zone. O. Oöphoron: this is the egg-bearing portion, sometimes called the parenchymatous zone, sometimes the cortical portion. S. Free external surface of ovary. K. Kobelt's tubes. Semi-diagrammatic.

manner of an unfertilized ovum. It has also been thought that they may be produced by portions of the epiblast or

mesoblast having become included in the ovary. Such portions remain dormant for a long time; then for some unknown reason they may take on an activity, which results in the formation of a dermoid cyst. Dermoid cysts, it should be remembered, are found elsewhere in the body besides in the ovary. They may occur at any age.

Parovarian cysts.—When the broad ligament is held up to the light, the series of tubules shown in Fig. 221 is seen in the region between the attached border of the ovary and the Fallopian tube. These vertical tubules are the parovarium, the remains of the Wolffian body. They open into a horizontal tube—Gartner's duct—the remains of the Wolffian duct. Some of the outer tubules do not run towards the

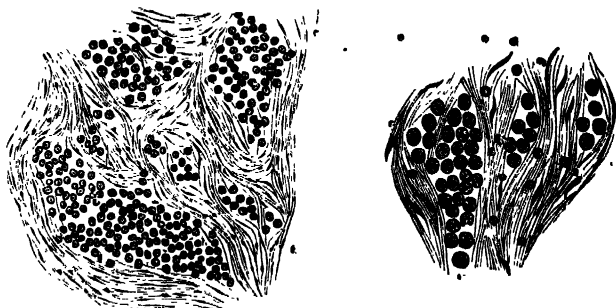


FIG. 222.—SECTION FROM A CARCINOMATOUS OVARY (Doran).
2-Inch and $\frac{1}{8}$-inch objectives.

ovary, but end as blind tubules between the layers of the broad ligament at its outer part. (Fig. 221, K.)

A parovarian cyst develops from one of the vertical tubes of the parovarium. As it enlarges, it separates the layers of peritoneum forming the broad ligament, and may come to lie at its inner part in close proximity to the uterus, and at its outer part close to the pelvic wall. As it burrows downwards, it comes to lie in close proximity to the ureter and the uterine artery.

Parovarian cysts are generally unilocular; they are thin-walled, and contain thin, clear fluid, in which a trace of albumen may be detected. They are lined by columnar epithelium, which later, as the result of pressure, may become

flattened, and as a result of further pressure may disappear. From the description of the mode of origin it will be seen that parovarian cysts have a covering of peritoneum which is generally loosely attached to the underlying cyst-wall, so that after the peritoneal covering has been incised, the cyst may be enucleated. As a rule parovarian cysts are sessile, but occasionally they may acquire a pedicle. They may contain papillary growths similar to those found in proliferating papillary ovarian cysts.

Parovarian cysts are not found before puberty.

Cysts may also develop from Kobelt's tubes. (See Fig. 221.) These are generally quite small, and have little importance.

Cyst of Gartner's duct.—Occasionally this may undergo cystic change, and at times even quite a large tumour may be formed in this way. Instead of the duct becoming obliterated it may persist, and run alongside the uterus, sometimes penetrating the uterine tissue at the level of the internal os. It may also continue for a variable distance down parallel to the vaginal wall towards the vulva. It will thus be seen how cystic changes affecting different portions of Gartner's duct may produce, according to the portion affected, vaginal cysts, or broad ligament cysts which, if the case is one where Gartner's duct has had a course partly through the uterine wall, may, on attempts at enucleation, be found to have a sort of pedicle internally of uterine tissue, which must be divided before the cyst can be completely removed. I have had a case of this kind in my own practice. The tumour reached an inch above the umbilicus, and bulged downwards, obliterating the right lateral fornix, and displacing the cervix, which could only be reached with difficulty during the examination, to the other side. The wall of this cyst was formed of uterine tissue, showing that the cyst had developed from that part of Gartner's duct passing through the uterine wall. There were two small secondary cysts in this case not communicating with the main cyst.* The patient made a good recovery. Clinically the important point is to operate on such tumours from the abdominal rather than from the vaginal aspect.

The Hydatid of Morgagni is a small cyst the size of a

* For a full report of this case, see *Proc. Roy. Soc. Med.*, vol. iii., p. 67.

pea attached by a long stalk to one of the fimbriæ at the outer opening of the Fallopian tube. It contains clear fluid, and has no clinical importance.

COMPLICATIONS LIKELY TO OCCUR IN CASES OF OVARIAN CYST.

The cyst-wall may inflame ;
The pedicle may become twisted ;
Severe hæmorrhage may occur into the interior of the cyst ;
The cyst may rupture ; or
It may undergo malignant degeneration.

Inflammation may occur, and, if it affects the outer surface of the tumour, lead to peritonitic adhesions. Adhesions to the omentum, to the parietal peritoneum, and to intestine are the most common. Deep adhesions in the pelvis are not at all rare. Among the least common are adhesions to the bladder. If inflammation affect the interior of the cyst, it may lead to suppuration. This is particularly likely to occur after tapping (though it often occurs independently of it), especially if air gain entrance into the cyst. It also often occurs owing to infection from the bowel, when the cyst is adherent to it.

Twisting of the pedicle.—This is especially likely to occur in cases where the tumour is small, or of medium size, and where the pedicle is relatively long. A good deal has been made of the difficulty of describing the direction in which the twist takes place, but the following method seems quite clear. If a watch be supposed to lie face upwards and parallel to the brim of the pelvis, during an operation on a case of ovarian tumour with twisted pedicle, then it is easy to note whether, in order to undo the twist, the tumour has to be rotated in the same direction as the hands of the watch move naturally, or in the opposite direction. Then, if in order to undo the twist of the pedicle the cyst has to be rotated in the same direction as the hands of the watch move, of course the original twist occurred in the opposite direction.

In ordinary cases of ovarian cyst with twisted pedicle the twisting is tight enough to obstruct the return of the venous blood, but not tight enough to stop the arterial supply.

Hence ensues enormous congestion of everything beyond the twist. The tumour and distal part of the pedicle become deep-purple, or nearly black, and much increased in size. Thus the outer part of the Fallopian tube lying beyond the twist becomes enlarged, so as to be as big as the ball of the thumb. Hæmorrhage takes place into the tissues of the pedicle and of the tumour, and also some bleeding occurs into the cavity of the cyst; as a rule, however, the blood effused in this way is not enough to affect the patient's colour.

Such a tumour generally soon becomes adherent to whatever organs are in contact with it by adhesive peritonitis. The tumour only becomes gangrenous in very rare cases; as a rule it receives sufficient blood by the new vessels formed in the adhesions to prevent its absolute death.

Severe hæmorrhage into the interior of the tumour, sufficiently to be a source of danger on account of the amount of blood lost, is a rare event, but it does occur.

Rupture.—Ovarian cysts occasionally burst, either from mere distention, or from mechanical violence. The contents escape into the peritoneum, and the further consequences depend on the kind of material the cyst contained. If a small ovarian cyst containing watery fluid rupture, the fluid will probably be absorbed, and nothing serious happen. When an ordinary multilocular ovarian cyst (proliferating glandular cyst) ruptures, the characteristic fluid containing pseudo-mucin sets up merely adhesive peritonitis, which may cause no symptoms—no pain or fever. If the contents of a cyst are infected, and it should burst, then general septic peritonitis will follow. When a tumour containing papillary growths ruptures, papillary growths arise by implantation in various parts of the peritoneal cavity, setting up what is practically and clinically a general malignant condition of the peritoneum. The contents of dermoid cysts are very irritating to the peritoneum. It is said that if a dermoid cyst ruptures, the cells which escape may set up dermoid growths in other parts of the peritoneal cavity.

Symptoms.—The symptoms that commonly attract the patient's attention, apart from one of the acute complications mentioned above, in cases of ovarian tumour are:—

Increase in the size of the abdomen.

Pain at some part of the abdomen.

Disturbance of menstruation.

Usually the first thing noticed is the increasing size of the abdomen.

Sometimes, however, pain in the abdomen is the first thing noticed, and sometimes some disturbance of menstruation. Sometimes trouble connected with micturition, or rarely even retention of urine, may be the first symptom; and in one of my cases prolapse of the vaginal walls, occurring in an unmarried girl of twenty-three, was the first thing to lead to an investigation.

Menstruation is frequently disordered in cases of ovarian tumour; usually the disturbance is in the direction of *amenorrhœa*, the quantity lost on each occasion being less than formerly, or the intervals between the periods being increased; or both of these conditions may be present. But it is not so very uncommon to meet with cases where the disturbance of the menstrual function is in the other direction, *i.e.*, where there is *menorrhagia*. I have seen several instances of this. Sometimes again, in cases of ovarian tumour, menstruation is painful; sometimes, on the other hand, whereas menstruation had been painful from the time when the function became established, from the time the tumour was first observed, menstruation has become painless. This was so in one of my cases, and it was also one where there was menorrhagia.

A Note on the Occurrence of Metrorrhagia after the Menopause in Cases of Ovarian Tumour.

During the years of menstrual life—that is to say, from the age of puberty, which may be taken as about fifteen, up to the menopause, which is normally established between the ages of forty-five and fifty years—the influence on menstruation exerted by the development of an ovarian tumour is well known. In about one-third of all such cases menstruation is unaffected; as regards the remainder, in the majority there is a tendency in the direction of amenorrhœa, the periods occurring either less frequently, or the quantity lost each time becoming diminished, or both these conditions may be combined. In a minority of cases the development of an

ovarian tumour is marked by the occurrence of menorrhagia. When, however, we come to enquire about cases where an ovarian tumour commences to develop *after* the menopause, as to whether hæmorrhagic discharges from the uterus may be caused by the ovarian tumour, and be rightly regarded as symptomatic of it, we find little or no information on the point in the majority of books to which reference would most naturally be made. It may fairly be concluded that the occurrence of bleeding from the uterus after the menopause in cases of ovarian tumour is a somewhat rare event. That this symptom may occur is, however, mentioned by Pozzi in the following passage: "After the menopause congestive phenomena have been noted in the uterus leading to the reappearance of a more or less irregular bloody discharge, which makes the patient believe menstruation has returned." At this passage there is a reference to a paper by Terrier in the *Revue de Chirurgie*, 1884, p. 1; but, on looking up this paper, it appears that he is speaking of the appearance of bleeding subsequent to the operation for removing the tumour, which is quite a different thing. The passage by Terrier is as follows: "To resume, in women already aged, accustomed, so to speak, to the menstrual flow, the periods have a certain tendency to reappear after the removal of both ovaries. But this red discharge only lasts a few months, and is not slow to disappear altogether." * In Garrigues' *Diseases of Women*, 1894, p. 565, the point in question is clearly but very briefly mentioned. He says: "On the other hand, even after the menopause, new hæmorrhagic discharges from the uterus may occur."

A special importance attaches to the causes of bleeding after the menopause, since, in such a large proportion of cases, as is well known, this symptom is due to the presence of a malignant growth at some part of the genital tract. It is interesting, therefore, to keep in mind that this symptom may in rare cases be due to the fact that an ovarian tumour is in process of development. While the tumour is still small, especially in a very stout patient, the occurrence of bleeding after the menopause may not improbably excite a suspicion of cancer. Without doubt, in all such cases,

* *Revue de Chirurgie*, 1882, p. 367.

the possibility of the presence of cancer should always be thought of first; but when cancer has been excluded by careful and repeated examination—and in some cases this is only possible after dilatation of the cervix—it is satisfactory to bear in mind that there are causes of metrorrhagia after the menopause other than cancer, and the development of an ovarian tumour is, in rare instances, one of them. The following case is an example of it:—

P. P. M., aged 54 years, was admitted into the London Hospital under my care on January 6, 1896. She was a widow, and had had seven children. She first noticed a swelling in the abdomen about six months previously, but she thought that it might have been present longer without her noticing it, as she was very stout. The swelling in the abdomen had increased very rapidly, she thought, during the last six weeks, so that, in her opinion, the abdomen was now twice the size it was three months before. For the last three months she had suffered very much from dragging pains, and general discomfort in the abdomen with dyspnœa. She was only fairly comfortable when lying on her right side. About three years previously the catamenia ceased, and she "saw nothing" for two years. There was then a period of bleeding, some blood coming away daily for six months. Then there was an interval of three months without bleeding. During the last month there had been a continuous red discharge daily. Up to three years previously she had been regular. She had "suffered from her chest and heart" for some years, with a good deal of shortness of breath. On examination the physical signs were those of an ovarian tumour reaching six and a half inches above the umbilicus. The circumference of the abdomen was forty-five inches at the umbilicus. On vaginal examination some brown discharge was seen about the external genitals, and the speculum showed some sanious discharge in the external os, but the cervix appeared normal. The sound passed three inches. Tilting the uterus with the finger gave one the impression that it did not form part of the large tumour in the abdomen.

On January 23 the patient was anæsthetized with the A.C.E. mixture, and the abdomen opened by the usual incision. On opening the peritoneum a good deal of free fluid was seen; this was soapy, and of thick consistence, and at once suggested that the cyst had burst, as was found to be the case. Most of the loculi of the tumour were small, and the size of the tumour could not be materially reduced by puncturing with the trocar. The incision was therefore extended above the umbilicus, and the tumour removed practically entire. An interesting point was the presence of recent adhesive peritonitis generally over the intestines, and in fact over whatever part of the peritoneal surface came into view. The patient had had no acute symptoms before the operation, no rise of temperature, no acceleration of pulse, vomiting, or more pain than the mere distention of the abdomen would sufficiently account for, and she walked to the operation table. Yet the cyst had burst, and the extravasated contents

had set up the general adhesive inflammation of the peritoneum above described. I had a similar case about five years previously, where, in spite of the rupture, there were no symptoms. In the present case the peritoneum was irrigated with warm saline fluid, and, a Keith's tube having been inserted, the rest of the wound was closed in the usual way. The tube was removed on the third day, and the patient made an uninterrupted recovery.

Apart from the bursting of the cyst before operation, an interesting point in the case is the return of a sanguineous vaginal discharge after complete cessation of the catamenia for two years. Generally, of course, after so long a period of amenorrhœa the reappearance of blood suggests malignant disease of the uterus; but so far as could be ascertained, without dilating the cervix, the uterus in this case was perfectly healthy. It seems certain that the metrorrhagia was to be accounted for by the development of the ovarian tumour exciting a sympathetic congestion of the uterine mucous membrane. I have seen the patient several times since leaving the Hospital, and she has never had any return of the sanguineous discharge, and she remains quite well.

Since the date of this case, I have seen several other examples of bleeding after the menopause, due to the growth of an ovarian tumour.

Pressure symptoms.—As the tumour attains a large size, pressure on the various organs leads to disturbance of their several functions.

Pressure on the bladder causes frequent, and sometimes painful, micturition, and this arises because the bladder cannot become distended in the natural way; rarely retention of urine may occur. Scanzoni, quoted by Dr. West, records a case where this was due to obstruction of the ureters, so that the retention of urine could not be relieved by a catheter. The tumour in this case was a cystic sarcoma, *i.e.* a sarcomatous tumour, partly solid, partly cystic; the solid part pressed on the ureters, and obstructed them, so that they became greatly dilated, one being 2 inches, the other 1½ inch in diameter.

I have seen retention of urine occur in a case of small ovarian tumour that had developed downwards and outwards between the layers of the broad ligament, so as to become fixed, although there were no adhesions between it and surrounding parts.*

Pressure on the rectum may cause obstinate constipation,

* The same case is referred to later in this chapter.

and even prevent the escape of flatus (West). Occasionally even intestinal obstruction may be produced. When this occurs, it may be a mere pressure symptom, or more probably it may be due to compression or twisting of the gut by the dragging of peritoneal adhesions formed during the growth of the tumour.

Pressure on the stomach causes dyspeptic symptoms, and sometimes vomiting. Wasting necessarily follows the interference with the functions of the stomach.

Pressure on the lungs and heart.—Difficulty of breathing is thus produced, and even asphyxia, as in a case recorded by the late Dr. Robert Barnes. In that case a young woman with a large ovarian cyst died suddenly, with symptoms of lung distress, in the hospital, while awaiting further treatment. At the post-mortem "the diaphragm was driven up so as to confine the heart and lungs within the narrowest space." Dr. Barnes concluded "that, under the impetus of some excitement or exertion, the heart and lungs were suddenly taxed beyond their feeble powers of adaptation, and that thus asphyxia was induced."

Pressure on large veins in advanced cases may lead to œdema of the legs; sometimes even thrombosis of the main vein of a limb may occur, as in one of my cases.

In that case œdema of the left lower limb, from the groin downwards, occurred suddenly, with pain in the limb and fever, while the patient was in the hospital awaiting operation. At the same time a number of superficial veins on the left side of the abdominal wall became dilated, that had not previously been so, and could be traced as communicating with a plexus in the skin over Scarpa's triangle.

Thrombosis in one of the trunk veins had no doubt occurred. The patient had a moderately high temperature for about a week. The leg was kept well raised; it remained considerably enlarged for some two or three weeks longer, after which it diminished in size, and, in six weeks from the time when œdema first occurred, it had returned nearly to its previous condition. Measurement, however, showed that it was still a little larger than the right. I then allowed her to get up; and, as in a few days she seemed

none the worse for doing so, decided to operate. At the operation no complication of any kind in the pelvis was found. The tumour was a moderately large one, about the size of the pregnant uterus at the eighth month. It contained fluid of a dark brown colour, and in consistence like treacle. The patient made a typically good recovery.

Prognosis.—This depends greatly on the nature of the tumour.

Follicular cysts and lutein cysts have little tendency to grow beyond a moderate size, or to destroy life. The common variety of dermoid cyst may remain quiescent for many years. Dermoids are rather more liable to suppurate than most other ovarian cysts, and also, incidentally, they may be a danger to life as a complication of labour, if impacted in the pelvis. Many cases of rupture of the uterus during labour have been due to this condition. The more complicated dermoids (teratomata) are clinically malignant. The *proliferating glandular* and *proliferating papillary ovarian cysts* will, on the average, run on to a fatal termination within three years from the time they first attract attention. *Malignant ovarian tumours* run a course to be measured by months.

Non-malignant solid tumours (*fibroids*) of the ovary grow very slowly, and may not endanger life for many years, or perhaps not at all.

Since, however, the determination of the exact variety of ovarian tumour present cannot, as a rule, be made with certainty till the abdomen is opened, and not always even then, but only when the tumour has been carefully examined after its removal, and since by far the larger number of ovarian tumours tend to destroy life within a limited time, the rule is that every ovarian tumour should be removed.

Diagnosis.—We consider the question of diagnosis either in :—

(1) *The early stages*, before the tumour has grown sufficiently to form an abdominal swelling ; or in

(2) *The later stages*, when the tumour has caused a more or less considerable enlargement of the abdomen.

I. In the Early Stages.

The conditions from which a small ovarian tumour has to be distinguished are:—

Early pregnancy.

Fæcal accumulation (more likely to give rise to mistake if situated to the right of the uterus).

Sub-peritoneal fibroid of uterus.

Dilated Fallopian tube.

Pelvic peritonitis.

Pelvic cellulitis.

Pelvic hæmatocele.

Retro-peritoneal cyst of congenital origin.

Malignant tumours when small.

Extra-uterine fœtation.

Retroflexion of the gravid uterus.

Congenitally misplaced kidney.

It may be said at once that in some cases the diagnosis of small ovarian tumours is easily made.

As a rule they are globular, elastic, freely movable, and can be, as it were, chased about the half of the pelvis to which they belong backwards and forwards with great ease, particularly if the patient is under the influence of an anæsthetic.

In such cases we can easily define the uterus as separate from the tumour, there being a distinct interval between them.

The only other tumours that give physical signs at all like these are a sub-peritoneal fibroid with a long pedicle allowing it to have a great range of mobility, and a dilated Fallopian tube; but sub-peritoneal fibroids are characteristically *hard*, whereas small ovarian *cystic* tumours are elastic. Moreover, we know that fibroid tumours of the uterus are, as a rule, multiple; there is usually more than one present. If no irregularity of outline could be made out as regards the uterus, this would be of some value in excluding fibroids. Occasionally a dilated Fallopian tube (hydrosalpinx, hæmatosalpinx, pyosalpinx) may be so little adherent as to have as much mobility as a small ovarian

cyst; and in such cases absolute diagnosis between them may be impossible prior to operation. As a rule it is only in the case of small ovarian cysts, partly or completely adherent, so that they are either quite fixed, or at least not freely movable, that real difficulty arises.

Early pregnancy.

As regards this, it is possible that the enlarged body of the pregnant uterus at, say, from eight to twelve weeks, *might* be mistaken for an ovarian cyst. The extreme softening of the tissues at the junction of the body of the uterus with the cervix, which is made use of in diagnosing early pregnancy—Hegar's sign—might just possibly cause the enlarged body of the uterus to be taken for a small ovarian cyst, while the cervix was supposed to be the whole uterus, not enlarged.

As regards **fæcal accumulation**, as a rule the use of aperients and enemata will clear up the diagnosis. A doubtful lump, if really fæcal, will be found to have disappeared after the bowels have been well evacuated.

I have seen one extraordinary case of fæcal accumulation where there was an ovoid mass, as big as the fœtal head at term, occupying the sigmoid flexure, which was of course widely dilated so as to extend completely across the pelvis. In this case the bowels were said to have acted freely after the usual aperients, and the results of enemata were said to have been quite satisfactory. The mass had certainly been present several months: it had the consistence of hard cheese. There was a moderate stricture of the bowel out of reach of the finger examining per rectum.

As regards **pelvic peritonitis,** or **cellulitis,** or **pelvic hæmatocele,** the history will be of great assistance. If we rely on the physical signs alone, there may be much difficulty. It may be said in general terms that the outline of an ovarian tumour, even with a number of adhesions around it, is more definite than the outline in peritonitis, cellulitis, and hæmatocele. When there is encysted serous effusion, or encysted purulent effusion, as a result of peritonitis, cellulitis, or suppurating hæmatocele, we must rely chiefly on the history; but even here the more diffused character of the physical signs will help us: for instance, in the case of a suppurating pelvic peritonitis, the pus being

encysted in Douglas' porch, there will probably be hardness *around the uterus occupying the pelvis more or less generally, except where the pus is actually present, i.e., in this instance, in Douglas' pouch. It must be remembered that "suppurating pelvic peritonitis" may in many, perhaps in most, cases* really mean that there is a pyosalpinx with adhesions. Again, in peritonitis, cellulitis, and hæmatocele there will usually be fever, or there will have been fever at some period of the case; whereas in most cases of ovarian tumour there is no fever: even when an ovarian cyst contains fœtid pus, there may be intervals when there is little or no fever. Though there may be such intervals in cases of suppurating ovarian cysts without fever, periods during which there is more or less fever are sure to be met with, if the case is sufficiently long under observation. (See case of Mrs. G., p. 359.)

Dilated tubes.—*Hydrosalpinx. Pyosalpinx. Hæmatosalpinx.*—These form swellings in the right and left posterior quarters of the pelvis, perhaps encroaching to a greater or less extent on Douglas' pouch. They are more often bilateral than unilateral. As there is always some peritonitis in their neighbourhood, it is usual for the swellings they give rise to, to be more or less fixed; only exceptionally are they found as freely movable as a small ovarian cyst. When there is an elastic, somewhat sausage-shaped swelling felt in the posterior fornix just reaching the middle line, and then a vertical groove, and then another elastic swelling on the other side of the middle line, the swellings being little if at all movable, there is considerable probability that they are dilated Fallopian tubes.

Extra-uterine fœtation.—Here the history, usually at first some interval of amenorrhœa, and then irregular hæmorrhages, perhaps with passing of a decidual cast of the uterus, the pain in one or other iliac region, and some of the sympathetic symptoms of pregnancy, *e.g.*, vomiting, help us. As regards physical examination, the presence of a tumour in the pelvis, somewhat elastic, usually more or less fixed, and situated in one or other posterior quarter of the pelvis; the enlargement of the uterus with blue discoloration of the vaginal portion and vaginal walls, and arterial pulsation in the vicinity of the tumour, together

perhaps with sympathetic changes in the breasts, enable us to arrive at a very probable diagnosis of extra-uterine pregnancy.

Retroflexion of the gravid uterus.—The elastic tumour formed by the body of the uterus might be mistaken for an ovarian cyst; more usually the resemblance is to an extra-uterine fœtation; and to distinguish between these conditions may be difficult, unless the patient is under the influence of an anæsthetic: there will then be usually no difficulty in pushing up the body of the retroflexed uterus, and satisfying ourselves that it is the body of the uterus. Besides, the history of the two conditions is different.

Congenitally misplaced kidney.—I have had one case where a lump fixed at the brim of the pelvis over the left sacro-iliac synchondrosis proved, when the abdomen was opened, to be a congenitally misplaced kidney. A tumour in that position might have been a solid, or solid feeling, ovarian, such as a dermoid, adherent in the position mentioned.

II. Diagnosis in Advanced Cases where there is an Obvious Enlargement of the Abdomen.

The conditions from which a large ovarian tumour has to be distinguished are:—

1. *Pregnancy.*
2. *Phantom tumours.*
3. *Distended bladder.*
4. *Ascites.*
5. *Fibroids.*
6. *Hæmatocele.*
7. *Encysted serous perimetritis and purulent perimetritis.*
8. *Hydronephrosis and pyonephrosis.*
9. *Hydatids.*
10. *Advanced extra-uterine pregnancy.*
11. *Tubercular peritonitis.*
12. *Malignant disease of the peritoneum.*
13. *Retroperitoneal tumour or cyst.*

Pregnancy has over and over again been mistaken for an ovarian tumour. Every obstetric physician in large practice sees examples of this mistake from time to time.

It will be well to mention shortly the physical signs that are usually present in the case of a large multilocular ovarian tumour (the commonest variety) about the size of the uterus at full term.

Inspection.—We notice that the abdomen is distended, the umbilicus not depressed—either level with the skin, or actually pouched out (if there is much co-existing ascites); on asking the patient to breathe slowly and deeply, if the abdomen is exposed in a good light we can often see the upper border of the tumour more or less distinctly outlined. We may notice that the enlargement of the abdomen is not symmetrical. Irregular projections due to the presence of secondary cysts may be visible at parts of the tumour, if the abdominal wall is thin.

Large subcutaneous veins will be seen at various parts of the abdominal wall, and skin-cracks similar to those met with in advanced pregnancy will usually be present.

The following measurements should be taken:—1. Maximum girth of the abdomen. 2. From the xiphisternal articulation to the umbilicus. 3. From the umbilicus to the upper border of the pubes. 4. From the umbilicus to each anterior superior iliac spine. 5. From the spinal column to the umbilicus on each side, so as to compare the semi-circumferences.

The greatest circumference of the abdomen in ovarian tumours is usually below the umbilicus—two or three inches below it, for example. In ascites, the greatest circumference is at the umbilicus. Again we measure the distance from the xiphisternal articulation to the umbilicus, and also that from the umbilicus to the pubes. Normally the umbilicus is an inch or so nearer to the top of the pubes than to the xiphisternal articulation; in cases of ovarian tumour this relation is often altered, so that these measurements are equal, or the lower measurement may even be greater than the upper, the relation of the measurements thus being inverted. Further, in ovarian tumours the umbilicus is not usually equidistant from each anterior superior iliac spine, as it is normally, or in cases of ascites.

In some cases of ovarian tumour, these measurements may not be in accordance with what has just been said, so

that too much importance must not be attached to them in differential diagnosis.

Palpation.—We recognise the presence of a tumour, and are able to define its limits above and laterally, more or less completely—below, we cannot usually separate it from the pelvis. The surface of the tumour is often felt to be irregular, owing to the projection of secondary cysts. Fluctuation can be obtained over the area occupied by the tumour, or parts of it. We may be able to feel the movements of the tumour during respiration, if the whole abdomen is not too tense.

Percussion.—The area of dulness occupies the middle region of the abdomen, shading off at the flanks, and at the epigastrium into resonance. The whole of the hypogastric region is dull. The dulness described is that of any large centrally situated tumour—an ovarian tumour, the pregnant uterus, a distended bladder, or a large fibroid tumour of the uterus. If we define the exact line at which dulness begins from above downwards during quiet respiration, and then ask the patient to take a deep breath and hold it, the displacement downwards of the tumour on inspiration causes the line at which dulness commences to be displaced downwards, so that, percussing in the same place, we get a resonant note in place of the dull note obtained before.

Auscultation.—Nothing but gurgling sounds (produced in the intestines) can be heard, as a rule, at any part of the tumour. Sometimes a crackling sound can be heard, which may indicate a localized peritonitis at the spot, but does not necessarily do so. Occasionally a sound having some resemblance to the uterine souffle may be heard over ovarian tumours; it is, however, never so distinct as in cases of uterine tumours.

On local examination.—There may be some bluish discoloration of the vaginal mucous membrane, but not approaching in degree that met with in advanced pregnancy. The vaginal portion of the cervix is neither softened, nor enlarged, and is not of a particularly blue colour. It is commonly quite as easy to reach it as usual, sometimes even more easy to reach it, owing to the uterus being pushed downwards. Exceptionally, owing to adhesions between the

tumour and uterus, the latter is so drawn up that it may be impossible to reach the os uteri with the finger at all.

It is not uncommon for the uterus to be a little to the right or left of the middle line.

Often nothing of the tumour can be felt on vaginal examination; sometimes lumps of perhaps the size of a walnut can be felt behind the uterus in Douglas' pouch. Supposing the rectum to have been emptied, these are, in all probability, secondary projections from the surface of the tumour, occupying Douglas' pouch, and they may perhaps be found adherent there at the subsequent operation.

The sound passes the normal distance ($2\frac{1}{2}$ to 3 inches); if much more, it is usually in cases where the cervix does not project into the vagina, the whole uterus being adherent to the tumour, and dragged upwards. This causes a moderate elongation of the uterine cavity.

It is often possible in cases of ovarian tumour to retrovert the uterus with the sound, and with the finger in the rectum to define the body of the uterus as quite distinct from the tumour.

In many cases where the uterus is in its normal position, and a large ovarian cyst lies above it, the body of the uterus can be easily identified on vaginal examination as a hard lump, having the shape of the uterus, felt to be slightly movable from side to side, against the lower convex portion of the superjacent cyst.

DIFFERENTIAL DIAGNOSIS.

Pregnancy.—What has been said on this subject at page 210, on the differential diagnosis of fibroids, applies equally here, and the reader is referred to it to avoid repetition. In addition, we may say that in advanced pregnancy (as we are now considering only the case of large abdominal tumours) it is easy to recognise the parts of the fœtus, the head particularly; and if the child is alive, we shall be sure, on repeated examination at all events, to hear the fœtal heart-sounds, and most probably feel the movements of the fœtus. Further, we can, on palpating in a leisurely manner

over the whole of the tumour, recognise that it alternately hardens and softens.

Pregnancy has not very rarely been mistaken for ovarian tumour, and occasionally an ovarian tumour is mistaken for pregnancy. I saw a case of ovarian tumour (there happened to be menorrhagia) where the case was supposed to be one of pregnancy with placenta prævia. Attempts, necessarily unsuccessful, had been made to induce labour. Such mistakes might always be avoided if only *all* the methods of physical examination at our disposal were employed as a matter of routine in every case where an abdominal tumour is present.

There are two cases of real difficulty in connection with the diagnosis of pregnancy, and these are not common. They are:—

1. Pregnancy with hydramnios.
2. Pregnancy complicated with an ovarian tumour.

1. *Pregnancy with hydramnios.*—The fact of pregnancy will be ascertained by the history of amenorrhœa, and other symptoms of pregnancy; and, as regards physical signs, by the condition of the breasts, and the softening of the cervix. Ballottement may sometimes be obtained by examining the patient in the erect position when it cannot be in the usual position.

The alternate hardening and softening that occur in the walls of the pregnant uterus will be recognised as affecting the whole surface of the tumour. Galabin says he has known cases of pregnancy with hydramnios tapped on the supposition that they were cases of ovarian tumour.

2. *Pregnancy complicated with an ovarian tumour.*—In early pregnancy there is a danger of the ovarian tumour alone being recognised. We must rely for diagnosis partly on the history, and, if the ovarian tumour is not very large, it may be possible to carry out the bimanual examination, and recognise the enlargement of the body of the uterus. The condition of the cervix should also be noticed. In advanced cases there will be the usual symptoms and physical signs of pregnancy to guide us, and we may recognise that alternate hardening and softening only occur in part of the swelling—that, of course, corresponding to the uterus.

Phantom tumours.—By this expression we mean enlargement of the abdomen, due (1) to the presence of flatus, or (2) to a large quantity of fat in the abdominal wall, or (3) to contraction of the muscles, so as to produce prominence of the abdomen. All these conditions are often present together. The history is not of much value, as the patient is often firmly persuaded she is pregnant, or that she has a tumour. Often by getting her to keep her mouth open, and breathe slowly and deeply, while we palpate the abdomen, we can sink the hands deeper and deeper at each expiration till we come down on the vertebræ.

Bimanually we can make out there is no tumour between the fingers, and that the uterus is not enlarged. Phantom tumours and pregnancy are, I think, the conditions which most often lead to mistakes: such mistakes might always be avoided by careful examination.

In cases where there is any uncertainty, the administration of an anæsthetic will always enable us to come to a definite conclusion.

I have known one case where a wide separation of the recti, allowing a large hernial protrusion of the intestines through the interval, was mistaken for an ovarian tumour.

Distended bladder.—In all cases of abdominal tumour a catheter should be passed, when, if it be the distended bladder, it will of course disappear as soon as all the urine has been drawn off.

Ascites.—The circumference of the abdomen is usually greatest at the level of the umbilicus in ascites. The umbilicus is equidistant from each anterior superior iliac spine, and maintains its normal position as regards the pubes and xiphisternal articulation, being about an inch nearer the former than the latter; no tumour with a definite outline can be either seen or felt. The flanks are somewhat bulged out, and the front of the abdomen somewhat flattened as the patient lies on her back.

In ascites, when the distention is only moderate, a distinct tremor of the surface is often visible, due to oscillations of the fluid during respiration.

The front of the abdomen in ordinary cases is resonant, while the flanks are dull. If, however, the colon on either

side is much distended with flatus, the note will be more or less resonant on that side. If there is a short mesentery, the intestines may not be able to float upwards, and the front of the abdomen may then be dull. This may also happen if the intestines are adherent, or the distention extreme. If the patient is turned on one side, the uppermost flank, previously dull, becomes resonant. If the fluid is enclosed by adhesions, so-called *encysted ascites*, diagnosis will be very difficult, perhaps impossible without an exploratory laparotomy.

Fibroids.—The diagnosis between fibroid tumours and ovarian tumours has been fully considered at page 214, to which the reader is referred.

Hæmatocele.—I have seen several cases where pelvic hæmatocele has been mistaken for a solid ovarian tumour. The history of sudden onset of the symptoms, characteristic of hæmatocele, will usually prevent mistake. Then, again, the tumour in hæmatocele is firmly fixed; whereas the solid ovarian tumour, unless it is malignant, is more likely to be movable: even when malignant, it may be movable at an early stage. Malignant ovarian tumours are usually attended by severe pelvic pain, with rapid loss of flesh, and ascites is not long in making its appearance. Whereas in hæmatocele, when the acutest stage is over, and the patient at rest in bed, pain is not usually severe; further, wasting and ascites do not occur.

When doubt arises, careful enquiry should be made for a history of extra-uterine fœtation (see p. 401), as almost all cases of hæmatocele are due to this condition.

Encysted serous or purulent perimetritis.—The history will help us to distinguish these conditions from ovarian tumours; the illness will date from some of the well-known antecedents of pelvic inflammation, *e.g.*, labour or abortion; there will be the history of pelvic pain, perhaps rigors and vomiting; there will perhaps be some fever present at the time the case comes under observation. As regards physical signs, the tumour formed in either of the cases under consideration rarely has the defined outline usual in cases of ovarian tumour, and it is usually much more fixed than an ovarian tumour. Again, on vaginal examination there will

usually be clear evidence of inflammatory exudation in the pelvis round the uterus, and this organ will be more or less fixed. In cases of ovarian tumour nothing abnormal is necessarily felt round the uterus; and, though its mobility may be restricted by the pressure of the tumour above it, the uterus is usually not anything like fixed. Occasionally, if we consider the case only on its physical signs, a centrally situated encysted collection of pus, due to perimetritis, may simulate an ovarian tumour; but the history and the presence of well-marked fever will help us to avoid error. In some cases it will be impossible before operation to distinguish between the cases here under consideration, and cases of pyosalpinx, or of suppurating ovarian tumour.

Hydronephrosis and pyonephrosis.—There will be a history of a tumour growing from above downwards; there will usually be disturbances pointing to kidney mischief, frequency of micturition, blood, pus, or albumen in the urine; and unless the tumour is large, we may expect to be able to separate it from the pelvis, *i.e.*, on palpation get the hand under it. We shall usually be able to trace the colon resonance across the tumour; and no line of resonance will be found between the tumour and the spinal column on the side from which the tumour grows. In cystic renal tumours the outline is regular, uniformly smooth and convex. On the other hand, an ovarian tumour is first noticed below, and has extended upwards; the intestines are behind it; there is usually a line of resonance in each flank between the tumour and the spinal column, unless the tumour is very large; again, the outline of the tumour is often irregular; while, of course, the urine, so far as the ovarian tumour is concerned, is normal; and menstruation is often disturbed.

In cases of hydronephrosis, if the case is some time under observation, the size of the tumour may sometimes be found to vary, the tumour diminishing, or indeed at times almost vanishing, owing to intermittent emptying of its contents into the ureter.

Hydatids only rarely occur in the pelvis; usually there will be a history of the swelling having spread from above down. When they do occur in the pelvis, they are almost certain to be mistaken for some more common pelvic tumour,

such as a small ovarian cyst. Tapping, which would probably enable us to make the diagnosis, is undesirable for other reasons.

Advanced extra-uterine pregnancy.—Here there will be the history, differing in all probability from that of ordinary pregnancy. The exact symptoms vary a good deal in different cases; but periods of amenorrhœa, broken by irregular hæmorrhages, pain in the lower part of the abdomen, perhaps expulsion of a decidua, are symptoms to be expected at some time. As regards physical signs in advanced cases, the parts of the fœtus can be felt with unusual distinctness through the abdominal wall; and if the fœtus is alive, we shall hear the fœtal heart. In actual practice early cases of extra-uterine pregnancy are most likely to be overlooked, or mistaken for pelvic cellulitis, or peritonitis; while advanced cases have to be diagnosed from ordinary pregnancy, or ovarian tumour. The only ovarian tumour at all resembling advanced extra-uterine pregnancy is a large dermoid cyst with bony projections and masses at various parts of it, producing some resemblance to the projections of fœtal limbs, or the fœtal skull. With care it will usually be easy to make out that the resemblance is only superficial, that the projections met with in the dermoid cyst do not correspond either in number or position with those caused by the presence of a fœtus.

Enlargement of the spleen.—The edge of the spleen looking to the right and upwards, and having a notch in it, and the history of the tumour having grown from above down, will usually serve to distinguish this from an ovarian tumour.

The tumour is found to have a sharp edge with a notch in it, this edge looking partly upwards, owing to some rotation having occurred as the spleen enlarged. The history will be of a tumour beginning above and spreading downwards. In most cases diagnosis is easy. Sometimes an ovarian tumour is mistaken for a splenic tumour. I remember a case of this, where the tumour had been thought elsewhere to be an enlarged spleen. At the London Hospital the tumour was thought to be ovarian, and at the operation was found to be so.

Tubercular peritonitis — Malignant disease of the peritoneum.—Both these conditions have not rarely been mistaken for ovarian tumour, and the diagnosis may be very difficult, and indeed is sometimes impossible, prior to exploratory operation. My object here is only to call attention to points that are practically useful in diagnosis, rather than to enumerate differences that—on paper—make the diagnosis appear easy.

As regards tubercular peritonitis.—There is often a considerable quantity of free fluid in the peritoneum: this, however, is by no means very rare in cases of ovarian tumour. Through the fluid it may be possible to feel solid masses; and a point of practical importance is that these masses are much more irregularly diffused than is the case generally with the irregular projections formed by the development of secondary cysts in the case of the ordinary ovarian tumour. On vaginal examination hard fixed swellings, or a general hardness of the vaginal fornices, is what may be expected in cases of tubercular peritonitis. The indefinite character of the hard deposits felt on vaginal examination in cases of tubercular peritonitis is a point of some importance. In large ovarian tumours often very little positive information is obtained on vaginal examination, except as to the exact length of the uterus.

Similarly, in cases of malignant disease of the peritoneum, the rapid formation of a large quantity of free fluid, with wasting and cachexia, is what may be expected. The masses felt are also often irregularly distributed, with wider intervals between them than would be the case if the masses were integral parts of an ovarian tumour, or projections from it. There is not generally fever in cases of malignant disease of the peritoneum; while in tubercular peritonitis, and in cases of ovarian tumour, if the tumour has become inflamed, fever is common.

Also on vaginal examination in the cases under consideration hard fixed masses are felt irregularly distributed, or lining the whole of the vaginal roof, and also having the indefinite outline which has already been referred to as characteristic in cases of tubercular peritonitis.

It will be seen that, altogether, tubercular peritonitis and

malignant disease of the peritoneum resemble one another more than they do the general run of ovarian tumours.

As regards exploratory laparotomy—in cases of tubercular peritonitis merely opening the abdomen—letting out the fluid, and closing the wound are sometimes followed by a great improvement in the condition of the patient. In cases of malignant disease of the peritoneum, on the other hand, exploratory laparotomy is by no means an innocuou proceeding. There is considerable risk that a low form of peritonitis may follow the operation, to which the patient will succumb. It appears as if the mere exposure of the peritoneum infiltrated with the malignant masses to the air was enough in some cases to lead to a fatal result. The healthy peritoneum easily disposes of any organisms, or of blood, or exudations following an exploratory incision aseptically performed; but the unhealthy peritoneum infiltrated with new growth often appears to be unequal to this task, so that peritonitis follows, and the patient dies. Whenever it is possible, therefore, it is highly desirable to distinguish tubercular peritonitis from malignant disease of the peritoneum. In the former case laparotomy is often very good treatment, whereas in the latter it is necessarily useless, and sometimes fatal.

In malignant disease of the peritoneum the growth has no doubt often started in the ovaries—the order of events being malignant degeneration of the ovaries, with subsequent diffusion of the malignant growth over the peritoneum generally (see Fig. 215).

The following are notes of a case of tubercular peritonitis treated by laparotomy. Before the operation the diagnosis was uncertain, and lay between (1) an ovarian tumour, (2) tubercular peritonitis, and (3) malignant disease of the peritoneum:—

H. C., aged 33; married two years; had had two children, the last three months ago. Suckled the child till two weeks ago. Was admitted into the London Hospital under my care on August 6, 1897. Her general health had been good, and there was no tubercular history.

Present illness.—Abdomen had been swelling for three weeks. Severe sharp pain in abdomen and back. Vomiting almost every day. No appetite. Constipation. Painful micturition. No œdema of legs.

Note on admission.—No apparent enlargement of liver. Heart nil.

Tongue swollen, "beefy," tremulous, and sore. Patient looks very ill, and is wasted.

Abdominal examination.—Abdomen is prominent generally. Umbilicus not depressed. Circumference at umbilicus, 37 inches; circumference 2 inches below umbilicus, 36½ inches; circumference 2 inches above umbilicus, 36 inches; umbilicus to pubes, 6 inches; umbilicus to xiphisternal joint, 8¾ inches. On palpation there is evidently a large quantity of fluid in the abdomen. Resonance in both flanks. Tip of xiphoid cartilage can be felt. Area corresponding to central part of abdomen, starting from umbilicus, with a radius of several inches, is dull. No outline of any tumour can be felt. Free fluctuation from side to side. Skin of abdomen slightly œdematous.

Vaginal examination.—Labia majora are superficially inflamed. Os uteri not very patulous. Cervix rather closer to pubes than normally. A hard mass felt behind and to the left, apparently fixed, or nearly so. Right side nearly free. Sound enters with curve forward 3 inches. Examination causes great pain.

Per rectum.—The mass is evidently outside and in front of rectum. There is a small amount of fæcal accumulation.

Temperature.—Between 98·5° and 100° for first six days; between 100° and 101·5° for next six days.

Occasional vomiting.

Operation on August 16.—Laparotomy wound of 5 inches made. Peritoneum found to be adherent to abdominal wall. Peritoneum incised. About two gallons of clear fluid escaped. Both parietal and visceral peritoneum were found to be studded with miliary tubercle. A mass about the size of a large cocoanut was seen rising out of the pelvis, apparently cystic. There were solid cake-like masses separate from the pelvis. The wound was then sewn up, no washing out of the abdominal cavity being done.

The patient stood the operation well, there being no vomiting after fifteen or sixteen hours. The temperature for two and a half weeks after the operation ranged between 98·5° and 100°, and after this was normal. The vomiting became much less frequent, the pulse-rate diminished, and the patient had much less pain, and began to put on flesh. She left the Hospital four weeks after the operation much improved. A large mass could still be felt in the lower abdomen, but there was no evidence of any fresh collection of fluid.

Retroperitoneal tumour or cyst.—I have seen one very rare case where a thin-walled cyst occupied the whole abdomen, and presented all the characters of a thin-walled tense ovarian cyst. A diagnosis of ovarian cyst was made. At the operation, however, the pelvic organs were quite normal. On tapping the cyst a very large quantity of reddish fluid, quite different from any fluid found in ovarian cysts, escaped. The cyst-wall was very thin, and as friable as wet paper. The cavity of

the cyst went back to the spinal column. The edges of the cyst were sutured as well as possible under the circumstances to the edges of the abdominal wound, and a drainage tube was inserted into the cavity of the cyst.

In a few days the tube was removed and the opening gradually closed. The patient remained well for a year or so: then the fluid re-accumulated, and the patient gradually sank. It seemed to be a retroperitoneal cyst of congenital origin, and was quite irremovable.

In another case a solid tumour (sarcomatous) grew from the pelvic retroperitoneal tissue in the neighbourhood of the left sacro-iliac synchondrosis. It raised up the external iliac artery, which coursed over the convex upper surface of the growth, and the left ureter could be seen about an inch internal to the artery. The external iliac vein was not on the surface of the growth, but below and to its inner side. After dividing the peritoneum I succeeded in enucleating the growth, which occupied the whole left side of the pelvic cavity. The growth was attached most closely to the left side of the sacrum and left sacro-iliac synchondrosis. The left external iliac vein was torn laterally in several places in the course of the enucleation, and numerous ligatures were required, which did not, however, obstruct the vein. Even after all visible bleeding-points had been tied, there was such free oozing that a roll of broad gauze had to be packed into the cavity from which the tumour had been enucleated. The patient suffered severely from shock and the hæmorrhage at the operation, and intra-venous injection of saline fluid was performed. But there was no hæmorrhage subsequently, and she did well as regards her recovery from the actual operation.

Treatment.—At the present time it is generally recognised that an ovarian tumour should be removed as soon as a diagnosis has been made. The natural history of these tumours is known; the large majority will run on to a fatal termination in three years, and they are liable to many accidents, which may place the patient in immediate peril at any moment. Tapping is undesirable (apart from the risk of setting up inflammation in the tumour, which, if nothing worse happens, will probably render its subsequent removal much more difficult by causing the tumour to become more

adherent to surrounding parts), because if the tumour be tapped, and happen to contain papillary growths, some of the cells are very likely to become detached from these, and, escaping into the general peritoneal cavity, set up similar growths there. No one should, under ordinary conditions, perform ovariotomy unless circumstances render it probable that he will have the opportunity of performing the operation a large number of times, since the mortality varies with the experience of the operator. A perfectly uncomplicated ovariotomy is an easy enough operation. It is, however, quite impossible to be sure beforehand that a particular case is a simple one. Unexpected complications and accidents are frequently met with, and can only be adequately dealt with by those whose experience in abdominal work has been considerable.

OVARIOTOMY.

By the word "ovariotomy" is meant the operation for removal of an ovarian tumour. As has been said above, ovarian tumours, if not removed, generally cause death. Hence it came about that gynæcologists devoted so much thought to endeavouring to find means by which an ovarian tumour could be successfully removed. As the late Sir Spencer Wells said, "Before 1860, ovariotomy sometimes succeeded, as often failed, and was very generally discredited." Very gradually, and largely as a result of Sir Spencer Wells' own work, the principles governing the success of the operation were discovered, and ovariotomy became a recognised operation. Later still, ovariotomy shared in the improvement resulting from the introduction of aseptic methods into surgery generally, and became what it is at present, one of the most successful of major operations. Ovariotomy, however, was undoubtedly the primary abdominal operation, the success of which prepared the way for the establishment of all the abdominal operations practised at the present time.

Preliminary considerations.—*The room for the operation.*—When the operation has to be performed in the room which the patient will occupy afterwards, as in private houses and many Nursing Homes, it is to be remembered that there will

be two persons constantly in the room, subsequent to the operation—the patient and the nurse—and that, according to the rules of hygiene, each of them requires at least 3,000 cubic feet of air per hour. The air can only be changed three or four times an hour without draughts. There should be therefore 2,000 cubic feet of space at least in the room; this will suffice if the ventilation is good. A room fourteen feet by twelve feet, and twelve feet high, contains roughly about the cubic space mentioned. There should be a fire-place in the room. A good light is of course indispensable.

If the size of the room will allow it, the bed and the operation table should both be in the room at the time of the operation; if the room is too small to allow of this conveniently, the bed may be brought in afterwards, the patient, well covered with blankets, in the meantime remaining on the operation table.

Assistants.—Two are needed, one to give the anæsthetic, and one to stand opposite the operator, and assist him with the operation. A third assistant is often useful. It is important that the anæsthetist should have had experience in abdominal cases; for if vomiting or coughing occur during the operation, the risk of the intestines coming out (and therefore, of course, the danger of the operation) is considerably increased. I prefer to have the patient anæsthetized with the A.C.E. mixture. Only one nurse is absolutely necessary; where two can be had as easily as one, it is better to have two. The nurse also should have had previous experience in abdominal cases.

Preparation of the patient.—She should be confined to bed for two days previous to the operation, and care should be taken that the bowels are acting regularly. Two nights before the operation a purgative is given, such as ʒ j.—ʒ ij. of liquorice powder.

Five or ten grains of the pil. col. c. hyoscyami will do as well. On the morning of the operation a copious enema of soap and water should be given.

The patient should have long warm stockings and a flannel vest with long sleeves, also a flannel jacket to wear over her nightdress, the object of this being to avoid any unnecessary chilling during the operation. In cold

weather I like the patient to wear also a "Gamgee jacket" round her chest. Two days before the operation the patient should have a hot bath, and wash thoroughly with soap, particularly the surface of the abdomen. If the operation is fixed for ten o'clock in the morning, the patient

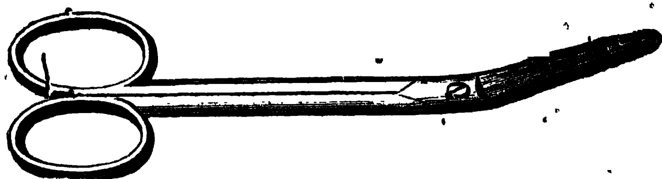


FIG. 223.—BLUNT-POINTED SCISSORS BENT ON THE FLAT.

may have some nourishment, such as a cup of soup or beef-tea, not later than five.

It used to be thought that ovariotomy should not be performed during a menstrual period; this is now known to make little, if any, matter. In two of my earlier cases, for instance, the patient was menstruating at the time of the operation. Both patients made good recoveries. In the first of these I was not told till afterwards that menstruation had

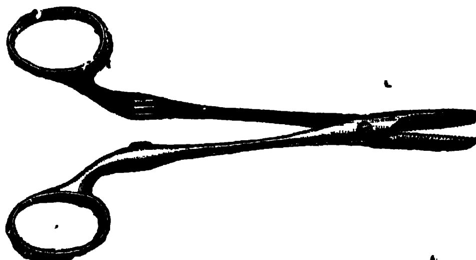


FIG. 224.—WELLS' SMALL PRESSURE FORCEPS.

begun. In the second case it appeared probable that mental emotion had something to do with the occurrence of the flow; the patient had previously had the operation postponed on account of menstruation, when she developed scarlet fever, and was away some ten weeks at the Fever Hospital. During that time she "saw nothing"; two days before the operation the menstrual flow began.

The sponges.—Twelve sponges are sufficient; three should

be small, and there should be one large flat sponge; the remaining eight are of the ordinary size.

Some prefer twenty sponges. The greater the total number used, however, the more the chance of the nurse making some mistake in counting them. The nurse must be specially informed of the importance of being absolutely certain as to the number of sponges she has. *On no pretence whatever* should any other sponge be brought into the operation room, nor should any sponge be torn in two, nor thrown away during the operation. No matter how good the nurse, I always count the sponges before and after the operation myself.

Artificial sponges.—For many years I have given up using marine sponges in abdominal cases. I use Gamgee pads, cut

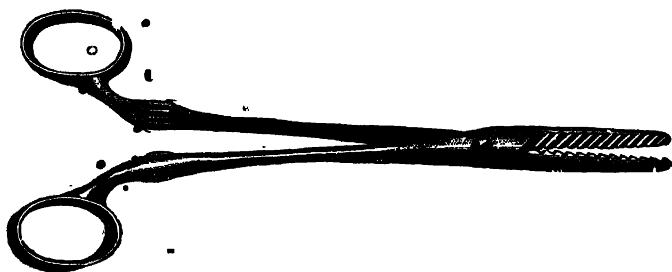


FIG. 225.—WELLS' LARGE PRESSURE FORCEPS.

Sometimes it is an advantage to have forceps of the same size and strength made with the terminals seen in the next figure.

of various sizes, and stitched round to avoid the cotton-wool escaping from between the layers of the netting. These pads are boiled before the operation. All that has been said as regards the number of sponges, &c., applies to the pads used in their place. New pads are of course used for each operation.

List of instruments, &c., needed for ovariotomy.—In an operation like ovariotomy, for which so many things are required, the only way to avoid omissions is to have a list of everything needed, and prepare for the operation in accordance with the list.

The ultimate responsibility for everything being right rests with the operator; but as, from the very circumstances

of the case, many matters of the greatest importance, both before and during the operation, have to be attended to by others, it may well be said that a successful ovariotomy or other abdominal operation is a triumph of *organization* quite as much as of *operation.*

The anæsthetic.

Sterilizer (see p. 37).

Trays (4).—They should be sufficiently deep to allow the instruments to lie well covered with either sterile water, or an antiseptic lotion, if preferred, without being too full. Trays made of enamelled iron are more convenient than those made of porcelain, and stand boiling much better.

Sponges (12).—See paragraph on sponges, *supra.*

Two pieces of thin mackintosh.—One to cover the clothes on the patient's chest; the other to cover the blanket over



Fig. 226.

the legs, and long enough to reach from the pubes to the feet.

Footbath or pail to catch the fluid.

Two kidney-shaped receivers, useful for catching fluid.

Sterilized towels (4 at least).—It is convenient to have one specially large towel with an oval opening in its centre, the opening corresponding to the area of the abdomen where the incision is to be made. The towels are of course sterilized, and used dry. It is a mistake to have them wrung out of any antiseptic lotion as used to be done, because wet towels are necessarily chilling to the patient.

Two scalpels.—One large and one smaller.

Scissors (*blunt-pointed*).—One straight pair, one pair bent on the flat.

A pair of large blunt hooks, the hook forming a segment of a circle the size of a penny.

Dissecting forceps.

A pair of forceps with teeth.—Useful for pinching up the layers of the abdominal wall to be divided, layer by layer, after the skin and fat have been cut through.

Twelve pairs of Spencer Wells' small pressure forceps.—It is convenient to have six pairs of straight forceps, and six bent on the flat.

Three pairs of small T-shaped Wells' forceps are sometimes useful.

Four pairs of Spencer Wells' large pressure forceps—two bent on the flat, and two straight pairs of medium length.

Pedicle needle for transfixing the pedicle. An instrument with a point that is not actually sharp, and yet not very blunt, is the one I prefer. The eye should take No. 12 braided silk, *when wet*, easily.

Thornton's trocar.

Volsellæ (2).

Two strong retractors.

Twelve pairs of straight needles for passing the deep sutures through the abdominal wall.

It is convenient to have two sets of these straight needles—a shorter set for thin patients, and a longer set for cases where the abdominal wall is very thick.

Silkworm-gut sutures, two sizes, thick and thin.

Hagedorn's needle-holder, and needles of various sizes, to be used with it, may be added to the list.

A few fine, straight needles for suturing intestine, &c.

Aneurism needle.

Bladder sound.

Uterine sound.

Three long peritoneal sponge-holders, similar in pattern to that figured on page 34, but a little longer.

Curved needle in handle.

Silk (Chinese twist, or braided silk—the latter is very strong,* and I prefer it for the pedicle).

All the silk to be used should be boiled in water just before the operation, for ten minutes. The full preparation of the silk is described on page 38.

* The following sizes should be prepared: Braided silk, No. 12. Chinese twist, Nos. 0, 3: No. 0 for fine ligatures, or for suturing intestine; No. 3 for tying adhesions. No. 12 braided silk for the pedicle.

Mackintosh aprons are required for the operator and his assistant. They should be long enough to reach from the neck to the feet, and must be thoroughly washed and carbolized before each operation.

Sterilized white jackets.

A lamp with reflector should be at hand for throwing light into the pelvis, if necessary.

Two ordinary mackintoshes.

Sterilized white gauze.—An ample supply cut in convenient sizes.

Sterilized Gamgee tissue.

A piece of boiled gauze, a yard and a half long, in case drainage may be necessary.

A flannel binder to pass over the dressing. It is well to have lint sewn at the part where the binder comes in contact with the patient's back. A binder with buckles and straps adapted to the size of the patient *after removal of the tumour* is preferable to the ordinary binder, which has to be fixed with pins, as the necessary degree of tightness can be much better regulated, and maintained. Such binders are supplied by John Bell & Croyden, of Wigmore Street.

Six basins, at least, besides those used for washing the hands—two for the nurse to use in washing the sponges, one placed conveniently for the operator, that he may rinse the hands from time to time during the operation, one containing plain water for rinsing off the soap after washing the hands, one containing biniodide of mercury in spirit, 1-500, and one containing 1-1000 perchloride and a nail-brush for the final disinfection of the hands.

Three new wooden nail-brushes—two for washing the hands and nails, and one to be kept free from soap, and used with the mercurial lotions.

A catheter.

An india-rubber catheter fitted on to a glass funnel, for giving saline injections per rectum.

Razor for shaving the pubes. This should be done by the nurse beforehand.

Hypodermic syringe for giving morphia, if necessary, after the operation.

Trendelenberg's operating-table, or one on a similar prin-

ciple. This is useful in case it be desirable to get a good view of the deeper parts of the pelvis. The patient's head is towards the window. With Trendelenberg's table there is a hinge-joint nearer the foot than the head, which enables the patient's pelvis to be raised to the desired extent till a good view is obtained. Figs. 157 and 158, pp. 296 and 297, show the table I use in my operating-theatre at the London Hospital.

Two quart jugs for use in washing out the peritoneum, *or a glass irrigation apparatus* with terminal glass tube. All jugs or irrigation apparatus to be previously boiled.

Transfusion apparatus.

LOTIONS, &C., NECESSARY.

Carbolic (1-20).—Four Winchester quarts at least, ready mixed.

Biniodide of mercury solution, in spirit, 1-500 (2 pints).

Tincture of iodine (℥ x.).

Lysol (℥ vi.).

Sublimate lotion (1-500).—Two Winchester quarts at least; or the tabloids for making 1-1000.

Sublimate glycerine (℥ ij. of 1-2000).

Methylated spirit for the sterilizer.

Hot water.—An unlimited supply.

Solution of sodium chloride (ʒ ij. to ℥ j.—℥ viij. should be at hand). This is boiled the day before, and what evaporates made up with boiled water.

A gallon of boiled water should be prepared for the operation. If the peritoneum is to be washed out, ℥ j. of the sterilized salt solution is added to a quart of the boiled water—this is then the right strength (ʒ j. of sodium chloride to the pint). A convenient plan is to add ℥ j. of the salt solution to a pint of cold boiled water, and then make it up to two pints, partly with boiling water from the kettle, and partly with more cold boiled water, till it is of the desired temperature.

The same salt solution is used for giving saline injections per rectum, where this is desirable in consequence of shock.

The Operation.

Just before the patient is brought into the room, or operating-theatre; a catheter should always be passed.

No spectators should be allowed in till the patient is under the influence of the anæsthetic.

As the patient lies on the table her clothes are drawn up round the waist, so as to be out of the way; the legs are then tightly wrapped in a blanket, arranged so that it can be tucked in below the feet.

As soon as the patient is unconscious, a thin mackintosh is placed over the blanket covering the lower extremities, and arranged so that all the blanket is completely covered. A smaller piece of thin mackintosh is similarly arranged over the chest.

While the patient is being anæsthetized the operator and his assistant have taken off their coats, and turned up their shirt-sleeves, well above the elbow. Then each puts on a mackintosh apron. They now wash their hands and arms thoroughly, paying special attention to the nails; about ℥ j. of lysol is put in the water for this first washing. The white jackets are then taken from the sterilizing box, and put on. The hands should then be washed a second time in water containing an excess of tincture of iodine, enough to make the water brown in spite of the soap, and, after washing, the soap should be rinsed off in plain water. The hands are then scrubbed in the biniodide and spirit lotion for a minute with a brush never used for soap. Then the hands and arms are to be scrubbed in 1-1000 perchloride lotion similarly with a nail-brush not used for soap.

If india-rubber gloves are going to be used, they have been sterilized previously, and the operator now puts them on. After doing so, he scrubs his hands (with the gloves on) once more in 1-1000 perchloride of mercury lotion, and rinses off this in sterilized water.

The assistant cleans up the skin of the abdomen by first rubbing it well with gauze dipped in an alcoholic solution of green soap; when this has been thoroughly done, he rinses off the soap with biniodide of mercury in spirit, and again rinses off this with perchloride of mercury lotion, 1-1000. Many

operators omit this, and simply paint the abdominal skin within the field of the operation with a 2-per-cent. solution of iodine.*

The sterilized towels are now arranged in position, and all is ready.

The incision.—The operator now takes a scalpel, and makes the incision.

This should be in the middle line, and should begin about one inch or an inch and a half below the umbilicus, and not extend lower than to within two inches of the pubes. As soon as the skin and fat are divided, the assistant should press a sponge firmly into the wound for a few seconds; the operator then fixes Wells' pressure forceps on any bleeding points. Unless the recti should have been separated, the sheath of one or other rectus must be opened, as there is no linea alba below the umbilicus (Treves). The operator pinches up the white aponeurosis in view with the toothed forceps, and makes an opening in it with a knife held flat. The aponeurosis is then divided to the full extent of the wound by means of blunt-pointed scissors. The recti are not to be cut; the operator must look for the interval between them, and divide the tendinous structures found there by pinching these up, and cutting, with the knife held flat, till the yellow sub-peritoneal fat comes into view. It is a wise precaution to have the parts so pinched up also held a little on the opposite side of the middle line by the assistant using a pair of small Wells' forceps. Spencer Wells' forceps are then put on any points that may be bleeding, and the wound sponged clean. The sub-peritoneal fat and peritoneum are then pinched up and divided, with the knife held flat as before. As soon as the opening made in the peritoneum is large enough to admit the finger, the forefinger of the left hand is introduced, and the peritoneum opened to the extent of the wound by means of blunt-pointed scissors passed along the finger.

The surface of the cyst, which usually has a greyish-blue

* The 2-per-cent. iodine solution used for painting on skin is made as follows :—

Iodine . . .	96 grains.
Potassium iodide	96 grains.
Rectified spirit .	10 fluid ounces.

colour, is now seen. The wound should be large enough to allow the operator to introduce his hand and part of his arm into the peritoneal cavity, so that he may thoroughly explore the relations of the tumour.

If the cyst is small, so that it can be removed without puncturing it, either through the existing wound, or by only enlarging this a little, it is better to remove it entire, as it is impossible to be sure beforehand that it may not be a dermoid, the contents of which are very irritating to the peritoneum, or possibly a cyst containing papillary growths. As a rule, however, the next step of the operation is puncturing the cyst.

The assistant steadies the cyst by placing his hands one on each side of the abdomen. The operator then takes the trocar and plunges it into the cyst, using no more force than is necessary. As soon as the trocar is in the cyst cavity, the canula must be projected beyond the trocar. It is well to seize the cyst-wall near the point of puncture with a small Wells' forceps. Great care should be taken to avoid allowing any of the contents of the cyst to escape into the peritoneal cavity. If the tumour is composed chiefly of a single cyst, it will soon have collapsed sufficiently to allow of its being drawn out of the wound ; if, on the contrary, the tumour is made up of several large cysts, besides the one punctured, it will not come out. It will then be necessary eitner to bring these in turn, so long as the tumour cannot be drawn out, up to the wound, and puncture them ; or the puncture first made may be enlarged, so that the operator can pass his hand and arm into the interior of the cyst, and break up the secondary cysts.

If the operator's hands are fouled with the contents of the cyst, he must wash them thoroughly before again using them within the cavity of the peritoneum. As the tumour is gradually drawn out of the wound, its surface is carefully watched with a view to the recognition of adhesions.

Adhesions to the omentum are the least serious. If the omentum is very extensively adherent, it must be tied in sections with silk. If too large a piece of it is trusted to one ligature, there is great danger of secondary hæmorrhage.

Adhesions to intestine are more serious. An attempt

must be made to separate the cyst from the intestine by pressing with a piece of dry sterilized gauze, assisted, if necessary, by scraping with a blunt instrument, such as dissecting forceps held closed, on the line of the adhesion just beyond where the border of the intestine is seen. If this does not succeed, the cyst-wall must be divided, and a thin lamella of it left adherent to the intestine. Adhesions deep down in the pelvis also require very careful management. The Trendelenberg position is very useful in dealing with adhesions in this situation.

According to their length and firmness, it will be right either to tie the adhesions with silk, or to split the cyst-wall, and leave a thin portion of it attached. This is especially to be recommended in the case of firm adhesions to the rectum.

Ligature of the pedicle.—The assistant holds up the tumour, so that the pedicle is well in view. The operator,

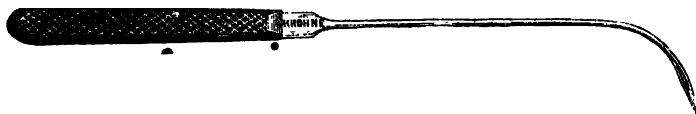


Fig. 227.—Pedicle Needle for transfixing the Pedicle.

holding the pedicle between the thumb and fingers of the left hand, selects the point through which to pass the pedicle needle, specially avoiding any vessel. He then transfixes it with the pedicle needle (Fig. 227), threaded with the silk previously selected for the purpose. The loop of the ligature is seized on the far side of the pedicle, and held while the pedicle needle is withdrawn. There are at least three good methods of proceeding from this stage.

1. The loop is drawn through till it is large enough to allow of its being carried over the whole cyst towards the operator; he then places one of the free ends above the loop, and, holding the pedicle with his left forefinger and thumb, draws the two free ends of the ligature taut, so as to constrict the pedicle. They are then tied as tightly as is possible without breaking the ligature. In making the first tie, the one end should be hitched twice over the other.

This mode of managing the ligature—drawing back the loop over the tumour—passing one of the free ends above

the loop, drawing the ends tight, and tying, is the one introduced by Lawson Tait, and the knot is called "the Staffordshire knot" (Fig. 228).

It is suitable where the tumour is small—for example, not larger than a cocoa-nut—and where the pedicle is thin.

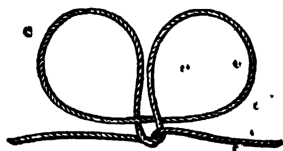


FIG. 228.—THE STAFFORDSHIRE KNOT.

Whatever method of ligature is adopted, when the knots are being drawn tight, the assistant must lower the tumour, so that the pedicle may not be on the stretch.

2. Another simple way of ligaturing the pedicle is to

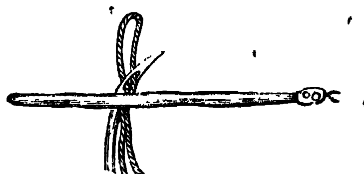


FIG. 229.—(Doran).

transfix as before, leaving a loop on the far side, then to carry one of the free ends round the pedicle, pass it through the loop, draw the two free ends tight round the other side of the pedicle, and tie them together (Figs. 229 and 230). This is

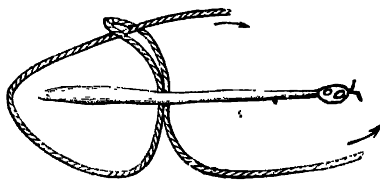


FIG. 230.—(Doran).

an extremely convenient method, and I have used it in a great many cases. This knot also answers well for tying the broad ligaments in vaginal hysterectomy.

It is important while tying the ligature, although aiming

at tying it tight, to stop well short of using the degree of force that will break it: apart from the waste of time in applying another, such an accident may lead to a tearing of the pedicle, and this may be very troublesome. In one of my early cases the ligature broke; I immediately turned to get another, and proceeded to transfix and tie what appeared to be the same pedicle as before. After the ligature was applied, there was an area outside it, from which rather free bleeding occurred; and as there had been no adhesions in the case, I was at first puzzled to account for it. It was really the outer part of the original pedicle which had been torn, or, as it were, had the peritoneum "scalped" off it by the first ligature. As soon as I made out what had happened I transfixed the broad ligament, and tied the bleeding surface with the Staffordshire knot. The patient made a good recovery.

Some recommend tying a preliminary ligature round the outer part of the pedicle, which contains the ovarian vessels, before applying the main ligature. It certainly appears to be an additional safeguard against secondary hæmorrhage; it cannot be considered as absolutely necessary, but it may be advantageously used when the ovarian vessels are very large, and the whole pedicle is thick and broad.

It is sometimes well also to tie a ligature round the whole pedicle, taking care to let the silk lie in the groove already made by the other ligature. All the ligatures are cut short.

5. Another method of tying the pedicle, and perhaps the one most generally used, is, after transfixing as before, to cut the loop on the far side of the pedicle, and tie the two resulting ligatures one round each half of the pedicle. Before tying, care should be taken to see that the ligatures interlock, otherwise the pedicle may be split.

When there is plenty of healthy peritoneum in the neighbourhood of the pedicle, it is always well to bury the pedicle completely to avoid the risk of intestine adhering to it. It is quite easy to pinch up the peritoneum at a distance of half an inch or so all round the pedicle, and suture it so as to bury the latter completely. Fine silk is used as the material for this suture.

A sponge fixed in a pair of sponge forceps (somewhat

resembling Wells' large pressure forceps) is now guided down along the fingers of the left hand into Douglas' pouch. If there is no bleeding, it is best to go on with the introduction of the sutures into the abdominal wall. A large flat sponge is passed into the wound, so as to keep back the intestines, and soak up the small amount of blood escaping as the sutures are being passed. No needle-holder is necessary; the operator begins at the upper end of the wound, pinches up the abdominal wall with the forefinger and thumb of the left hand, and passes the needle from the peritoneum, about a quarter of an inch from the cut edge, through all the structures of the abdominal wall, muscle included, and brings out the needle on the skin about a quarter of an inch from the cut edge. The needle already threaded in the other end of the suture is then passed similarly through the abdominal wall on the other side. When as many sutures have been passed as seem necessary, the free ends on each side are gathered together, and fixed with a pair of Wells' forceps; the loops of the sutures lying across the wound are then pulled long enough to allow of their being caught, and held out of the way by blunt hooks in the upper and lower angles of the wound. The flat sponge is then removed. If much of the cyst contents has escaped into the peritoneum, especially if these seem to be of an irritating or septic kind, it may be desirable to wash out the peritoneal cavity with sterilized normal salt solution (ʒ j. to Oj.) heated to blood heat. The edges of the wound are held together, and the abdomen is kneaded, so that the fluid may wash the peritoneum thoroughly. The time occupied in the process, and the quantity of fluid to be introduced, will depend entirely on the degree to which the peritoneum has been fouled. For example, if fœtid pus from a suppurating cyst has got into the peritoneum, the washing must be done thoroughly. Some operators, however, do not wash out even in such cases; they rely entirely on sponging, and consider that washing out rather tends to diffuse the irritating material through the peritoneal cavity generally. In any case, however, where pus is expected, it is well to pack off the upper part of the abdomen first with sponges, and then with a large plug of sterilized white gauze. When

PLATE XIV.

A

B

C

D

E

F

G

FIG. 1

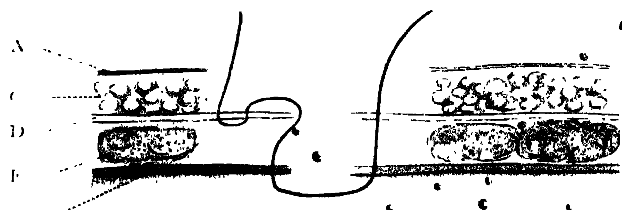


PLATE XIV.

To illustrate the mode of suturing the fascia and peritoneum of the abdominal wall described in the text. The deep "through and through" sutures which penetrate the whole thickness of the abdominal wall are not shown.

FIG. 1.—A. Skin. B Two mattress sutures tied. C. Fat. D. Fascia. E. Shows two mattress sutures in position, but not tied. F. Muscle. G. Peritoneum.

FIG. 2.—The abdominal wall shown in section to show the mode of passing the mattress sutures. A Skin. C. Fat. D. Fascia. F. Muscle. G. Peritoneum.

all the obvious pus has been got rid of, the gauze plug is removed, *but not the sponges.* Then, with the patient horizontal, the pelvic cavity can be washed clean without any risk of diffusing the pus into the upper part of the abdomen. This washing out of a "compartment" of the peritoneal cavity is not open to the objections raised to washing out the peritoneal cavity as a whole. Then the sponges are removed, and the wound closed. When the patient is feeble or much collapsed, it is a good plan to leave a quantity, say two pints, of saline solution in the peritoneum.

The operator should not forget to look at the other ovary; if it should be in a state of cystic degeneration, it must be removed also.

The sponges and forceps must now be carefully counted before closing the wound; it is best that the counting be done under the operator's eye, so that he may feel personally certain that the numbers are correct. He should, besides, always count them himself at the end of the operation.

At this stage it is necessary to suture together the cut edges of the peritoneum, and also the cut edges of the deep fascia. It is usually advised to stitch the edges of the peritoneum together separately first, using whatever suture material the operator prefers, such as catgut or silk, and to suture the edges of the fascia subsequently. My own practice for a long time has been to suture the edges of the peritoneum and of the fascia together, either with a series of interrupted sutures, each suture including (from side to side) fascia, peritoneum, peritoneum, and fascia, or with a series of mattress sutures, each suture passing through (for instance, starting on the left side of the wound) (1) fascia (left), (2) peritoneum (left), (3) peritoneum (right), (4) fascia (right), the needle entering first on the upper surface of the fascia, emerging again on its return on the upper surface of the fascia (right), then through the peritoneum (right), peritoneum (left), and fascia (left). The suture is then tied—the effect is to bring together the cut edges of the peritoneum and the cut edges of the fascia; but, as regards the latter, the approximation is such that the cut edge of the left side overlaps the cut edge on the right The advantage of the mattress suture is that it not only approximates the cut

tissues transversely, but also to a moderate degree in the longitudinal direction. There is thus less chance of leaving weak places between the sutures than when ordinary transverse interrupted sutures are used (see Plate XIV., Figs. 1 and 2). As to the material to be used for these peritoneal and fascia sutures, I prefer silkworm gut when there is enough fat in the abdominal wall to prevent the cut ends of the sutures being subsequently felt through the skin. When the layer of fat is thin, I use chromic gut.

The abdominal sutures are then tied, the edges of the skin being carefully adjusted, and the sutures not tied too tightly. Superficial sutures of fine silkworm gut are inserted where necessary with a small curved needle held in a needle-holder. The wound is then dressed. Several layers of plain white, dry, sterile gauze are applied over the wound, and two or more large pads of sterile Gamgee tissue are placed over the gauze. The whole is kept in place by a tightly pinned binder. A binder made with straps and buckles, and previously adapted to the patient's measurements, is more convenient than one which is fastened by pins. The necessary degree of tightness can be more easily regulated and maintained.

For stout patients, and those who may have developed a cough, the Sister in charge of my wards at the London Hospital has devised a belt made of brown holland strapping, which is very useful.

It is made with buckles and straps, the latter formed by cutting and turning in the strapping. According to the size of the wound one or two breadths of strapping may be required. If a supply of the buckles is kept, such a belt may be easily made in a few minutes from a roll of brown holland strapping. Such a strapping belt is fastened over the dressing, and underneath the abdominal binder. The patient is then put back to bed.

An alternative method of suturing the abdominal wall.—The peritoneum and fascia are sutured separately with whatever suture material the operator prefers.

Then the fat surface on one side is approximated to the cut fat surface on the other side by a continuous catgut suture pulled sufficiently tight. Finally the edges of the

skin are brought together by a fine continuous, catgut subcuticular suture.

I have tried the above method extensively. It produces a narrow inconspicuous scar in favourable cases. This is its chief recommendation. I am satisfied that it does not produce such close approximation of the recti, or so sound a union of the cut edges of the fascia, as when the "through and through" sutures passing through all the layers of the abdominal wall are used.

In cases where there is much vomiting or coughing, the strain is taken off the fascia and peritoneal sutures by the deep sutures passing through all the thickness of the abdominal wall. When these "through and through" deep sutures are not used, all such strains have to be borne primarily by the peritoneal and fascia stitches.

Special difficulties during the operation.—There may at the outset be some difficulty in ascertaining when the peritoneum has been reached; this is likely to occur when there are dense adhesions between the anterior surface of the tumour and the parietal peritoneum. Under such circumstances it is best to enlarge the wound in an upward direction, so as to endeavour to strike the peritoneal cavity above the adherent part of the tumour.

The tumour may be found to have no pedicle, having grown between the layers of the broad ligament beneath the pelvic peritoneum.

Enucleation.—When no pedicle can be established, the peritoneal covering of the tumour must be incised, and the cyst shelled out of its subperitoneal "bed." Large vessels must be seized with Wells' forceps, and tied. When such a cyst has burst, or been tapped, it is difficult to recognise its exact boundaries. I have been accustomed in such cases to pack the cyst tightly with a roll of sterile gauze. In this way the outline is defined, and there is no chance of leaving some of the cyst-wall behind.

A careful watch should be kept for the ureter, which may be in close apposition to the deeper part of such a cyst.

As regards the cavity from which such a tumour has been enucleated, it is necessary to look for all bleeding points of any importance, and tie them. Then the edges of the

opening made into the peritoneum covering the cyst are brought together with fine silk sutures. The abdomen is then closed in the usual way.

Other difficulties.—On opening the abdomen the tumour may prove to be malignant, and so densely adherent in every direction that removal of it would be impossible. Generally secondary malignant nodules will be visible on the parietal peritoneum, and elsewhere, in cases of this kind. In such cases the wound must be closed. Apart from malignancy, an ordinary ovarian tumour may be so universally adherent that complete removal is impossible. This is very rare indeed when the operator has had much experience. In such a case the opening made by the trocar in the cyst is enlarged, the hand introduced into the cyst cavity, and as much as possible of the solid material in the cyst, if any, removed; the edges of the cyst are then stitched to the abdominal wall, so as to shut off the cyst cavity from the general peritoneal cavity, and a drainage-tube is inserted.

Drainage.—In the account given of an ordinary complete ovariotomy, drainage is not mentioned, because in the large majority of cases it is not required. The tendency of practice in the last two decades has been for drainage in abdominal cases to be less and less frequently used. Practically it is hardly ever used in gynæcological laparotomies at the present time. Drainage, moreover, adds to the difficulty of the after-treatment, and unless very skilfully managed is an additional source of danger in itself.

Almost the only cases requiring drainage are those—and these are very rare—where there is some bleeding, which cannot be stopped by the usual means, and here a sufficient quantity of sterile white gauze from a roll is packed against the bleeding area, and the end of the gauze left projecting at the lower end of the abdominal wound.

In some other cases drainage for a couple of days or so may be a wise precaution; for instance, where the bowel has had to be extensively sutured, or where wounds of the bladder have required suture. Drainage in such cases may be effected by a strip of gauze, with or without an india-rubber tube, carried to the bottom of Douglas' pouch. It is taken out at the end of the third or fourth day; a short strip is then

inserted, so that the cavity left after removing the first piece of gauze may fill up from the bottom.

After-treatment.—The patient has nothing given her by the mouth for the first twenty-four hours except small quantities of hot water. During this time her strength is supported by nutrient enemata given every eight hours. In patients who are suffering from shock, rectal injections of normal saline solution may be given at frequent intervals every two to three, or four hours, for a longer or shorter period according to the effect. Ten ounces at a time is usually retained and absorbed in such cases. The nutrient enema should not be more than four ounces in quantity; it may consist of two ounces and a half of peptonized beef-tea, one ounce of coffee, and half an ounce of brandy. Great care is necessary to avoid (1) giving the enemata too frequently, or (2) persisting with them longer than is absolutely necessary. I have known a very troublesome diarrhœa to be set up in this way. An india-rubber "rectal" tube should be passed a little way into the rectum to allow flatus to escape before giving the enema, and also at other times to facilitate the passage of flatus. It must not of course be passed too soon after a nutrient enema or injection of salt solution has been given. Hypodermic injections of morphine are given if the patient is in much pain; they are not always necessary. I generally find that gr. $\frac{1}{6}$ given on the first evening is sufficient. Repeated doses of morphine retard the passage of flatus, and tend to prolong the period during which the patient suffers more or less discomfort. After the first twenty-four hours, if there is no sickness, she may begin to take fluid nourishment by the mouth, commencing with a teaspoonful of a mixture of equal parts of pancreatized, or peptonized, milk and lime-water, or of milk and barley-water.

It is a great mistake to give large quantities during the first three or four days after an abdominal section.

If all goes well, the wound need not be dressed till the eighth day. The superficial skin sutures are removed then. It is well to leave the deep sutures till the tenth day after the operation. At that time all the sutures are taken out, and the abdomen should be well strapped, so as to support the wound as much as possible.

When the fascia and peritoneum have been stitched by buried sutures as above described, there is little or no risk of the wound bursting open. If the fascia is not stitched, there is a considerable risk of the wound bursting open after the deep sutures have been taken out, especially if the abdomen is not well strapped. In such cases the risk is greater the earlier the sutures have been removed.

It is well to try to secure an action of the bowels within the first three days after the operation. Turpentine enemata will probably have been used to assist the removal of flatus, almost as a matter of routine. They may cause an actual motion. My custom is to give, as a matter of routine, on the second evening after the operation, one grain of calomel every two hours till the patient has had five grains; a soap and water enema is given in the morning.

No solid food should be given till the bowels have acted.

When a case is going to do badly after an operation, unfavourable symptoms usually set in about the third day.

Rise of temperature, rapidity of the pulse, vomiting, hiccough, and abdominal distention may occur.

The more of these symptoms that are present together, the worse the prognosis.

Another early symptom, if the case is going to do badly, is a change in the appearance of the patient's face; it acquires a pinched look. The patient may be slow in apprehending what is said to her, and there may be some degree of restlessness.*

A high temperature may be treated by applying ice to the head by means of an ice-bag. Brandy must be given according to the state of the pulse.

If all the unfavourable symptoms mentioned are present, very little can be done for the patient, and she is almost certain to die before the eighth day.

No effort should be spared to secure an action of the bowels.

In my experience, as regards prognosis, the most important thing to judge by is the pulse, both as regards its frequency and its quality.

Lawson Tait wrote as follows: "Concerning fatal cases,

* Little anxiety need be felt as regards patients who sleep well.

I am altogether of Dr. Keith's opinion, that the very first search to be made for an explanation should be in the details of the operation." * This advice is, I am sure, as sound at the present time as when it was first written.

In all cases of abdominal section the patient should remain three full weeks in bed.

When she is convalescent, an abdominal belt should be ordered for her. She should wear it for a year after the operation. Another point of importance is to warn her to be exceedingly careful to rest, and to avoid any exposure at the menstrual period for some time to come. Neglect of this precaution may lead to very alarming symptoms, high temperature and rapid pulse particularly, which, however, usually pass off in a few days.

Mortality of ovariotomy.—Although long run of cases are recorded from time to time without any fatality, yet it may be taken that, if the rule of operating on every case of ovarian tumour as it comes is followed, without any rejection of cases, there must be some mortality, which, however, should not exceed 2 per cent.

As regards my own experience, in the period from April 3, 1901, up to December 31, 1911, I had performed 1,083 abdominal sections, in addition to 46 cases of Wertheim's operation, which I think it right to put in a separate class by themselves. Among the 1,083 cases there were 328 ovariotomies. Five cases died. This gives a mortality of 1·5 per cent.

The word "ovariotomy" strictly means the removal of an ovarian tumour, cystic or solid; but practically it is desirable to include also in a group of ovariotomies all operations for removing a cyst of the broad ligament, a parovarian cyst, or a tubo-ovarian cyst. I have followed this rule in classifying the 328 ovariotomies just referred to.

OVARITIS.

Etiology.—The conditions which cause ovaritis are:—

Sepsis { in connection with labour and abortion.
{ in connection with operations on the uterus.

* *Diseases of the Ovaries*, 4th edit.

Gonorrhœa.
Certain fevers.

Among predisposing causes may be reckoned :—

Alcoholism (Matthews Duncan) and
Recent marriage.

On looking through this list, it will be seen that most of these causes are causes of pelvic inflammation (pelvic peritonitis and cellulitis).

It is difficult to imagine what may be called an isolated ovaritis, *i.e.*, an inflammation of the ovary without any implications of the structures in the immediate neighbourhood. Probably in most cases ovaritis is secondary to pelvic peritonitis or cellulitis. *In the case of ovaritis secondary to pelvic peritonitis*, the inflammation has spread along the Fallopian tube to the peritoneum, producing pelvic peritonitis, which involves the peritoneal aspect of the ovary, producing adhesions between it and surrounding parts, *e.g.*, the Fallopian tube : this is *periovaritis*. Probably the follicular variety of ovarian cystic tumours has originated in connection with inflammation spreading in this way to the ovaries from the Fallopian tubes. Just as in pelvic peritonitis the tissue immediately under the peritoneum must participate to some extent in the inflammation, so in periovaritis no doubt the superficial layers of the parenchyma are at the same time to some extent involved. *In the case of ovaritis secondary to pelvic cellulitis (interstitial ovaritis)*, the inflammation has spread along the connective tissue in the fold of the broad ligament forming the mesovarium to the parenchyma of the ovary. Under pelvic cellulitis I have referred to a specimen I had the opportunity of examining, where the inflammation in the broad ligament was in the stage of phlegmon, while that in the adjoining ovary had gone on to abscess. A follicular form of ovaritis is described where the contents of Graafian follicles become turbid, or purulent, the parenchyma of the ovary being more or less involved at the same time. It is sufficient, however, to speak of *periovaritis* and *interstitial ovaritis.*

Ovaritis may be acute, or chronic. In the acute form there is more or less enlargement of the ovary. In the chronic form the organ is usually enlarged ; but, on the other

hand, it is said, that it may be smaller than normal, the change being of a cirrhotic nature, with destruction of follicles. It is well to remember that healthy ovaries vary considerably in size. The ovaries, even in the same body, are often different in size; and, again, the same ovary varies in size at different times, enlarging during menstruation and pregnancy.

Except when there is a great deal of fat in the abdominal wall, the ovaries can be felt by those practised in bimanual examination, even when the ovaries are of normal size. This can certainly be done with the aid of an anæsthetic, and not rarely even without it in those people who submit well to the examination. We must not conclude, therefore, merely because the ovaries are to be felt, that there is necessarily anything abnormal—any inflammation or degeneration of the ovary.

Symptoms and signs.—*In acute cases* these are the same as for the pelvic peritonitis or cellulitis, to which the ovaritis is in the large majority of cases, if not in all, secondary.

In chronic cases the patient complains of pain at the affected side; dysmenorrhœa, pain on coitus, sometimes pain on micturition, or defæcation. There is sometimes menorrhagia. Whether this is present or not depends on whether there is co-existing endometritis of the body of the uterus, or not (Matthews Duncan).

As regards the physical signs, the uterus is probably less movable than normal, owing to the persistent adhesions; and there is a swelling about the size of a large walnut in the situation of the ovary, this swelling often being more or less fixed.

Such swellings, when they come to be examined after removal by operation, or post-mortem, are often found to consist of the Fallopian tube (more or less dilated, its fimbriated extremity often not to be recognised, the tube ending on the surface of the ovary), matted to the ovary by adhesions; and there are also adhesions between the swelling, formed by the tube and ovary, and adjacent parts. Such a condition is not uncommonly bilateral. I have known cases where swellings, believed to be enlarged ovaries, as the result of physical examination, were found to be chiefly due to dilatation of the Fallopian tubes at a subsequent operation.

Treatment.—The treatment of acute ovaritis is that of acute pelvic inflammation, and the treatment of chronic ovaritis is very similar to that for chronic pelvic inflammation, *e.g.*, blistering, or painting the area to which pain is referred with iodine; hot vaginal douches; the use of a glycerine plug every night (once or twice a week the plug may be soaked in ichthyol glycerine, 5 to 10 per cent., instead of in plain glycerine); and regulating the bowels. Internally, ichthyol, gr. ijss., in pill twice daily, is sometimes useful. If there is menorrhagia, ergot, or bromide of potassium in scruple doses, may be tried. Though many cases improve under such treatment, the improvement is often only of a temporary character. This is especially so where the patient is of a markedly neurotic temperament. Apart from this, many cases undoubtedly get well, if the course of palliative treatment is sufficiently prolonged. When this is not so, the question of removal of the ovaries and tubes may have to be considered. The patient must thoroughly understand what it is proposed to do—the possibility that she may not be cured by it; and the sterility necessarily produced (though many such cases are *per se* sterile, owing to occlusion of the tubes). The operation is a more difficult one than ovariotomy, owing to the dense adhesions often met with.

Displacements of the Ovary.

It must be remembered that the position of the ovary is constantly varying, according to the position of the uterus. This follows from the intimate connection of the two organs, so that there is no one position entitled to be considered *the* normal position of the ovary. In reality there are several normal positions for it.

Hernia.—Prolapse.

Hernia.—The ovary may be found in a hernial sac, usually that of an inguinal hernia. Cases of this kind are usually congenital. The treatment consists of protecting the organ from pressure by a suitable shield. If this cannot be done, and the suffering is considerable, it may be removed by operation.

Prolapse.—The common form of this is where the ovary

descends into Douglas' pouch. It does this in marked retroversion or retroflexion of the uterus. In such cases both ovaries can usually be felt in the posterior fornix, one on each side of the swelling produced by the uterus. Again, in cases of procidentia uteri, when the whole uterus lies outside the vulva, the ovaries can often be felt at the sides of the uterus.

The ovary may, however, come to lie in Douglas' pouch if its attachment to the broad ligament becomes stretched, without any displacement of the uterus. Such stretching is likely to occur when the ovary enlarges from any cause, and remains freely movable.

Symptoms.—Pain on coitus is present, and perhaps also pain on defæcation, or there may be more or less constant pain, aggravated on such occasions. Menstruation may be irregular. This will depend rather on other changes, *e.g.*, commencing cystic degeneration, or inflammation affecting the ovary, than on its mere prolapse.

Diagnosis.—The swelling, suppose it to be the size of a walnut, is felt in the posterior fornix. It may be movable or fixed, according to the presence or absence of adhesions. It must be distinguished from the body of the retroflexed uterus. This is easily done either by the bimanual examination, feeling the body of the uterus in front, or by passing the sound. The sickening pain caused by pressure on the ovary also serves to identify it.

Treatment.—If the prolapsed ovary is movable, it may be pushed up, and an effort made to keep it up by inserting an elastic ring pessary of suitable size, or a Hodge's pessary, preferably one with its upper end made to contain glycerine, so as to produce a soft cushion. If palliative measures fail, we may remove the ovary by operation, if the patient is anxious for this to be done, after the nature of the proposed operation has been explained to her.

Malformations.—It is sufficient to mention that the ovaries may in rare cases be congenitally absent. Sometimes one ovary and the other uterine appendages of the same side are wanting. The corresponding kidney may also be absent. A more frequent anomaly is that the ovaries are present, but are imperfectly developed, and remain so throughout life.

CHAPTER XVII.

FLEXIONS AND VERSIONS OF THE UTERUS. INVERSION.

The normal position of the uterus.—The accompanying diagram (Fig. 231) shows what may be taken as the normal position of the uterus when the bladder is empty. The position is one of slight anteflexion.

It must not be forgotten, however, that although it is customary to speak of that position of the uterus as more particularly *the* normal position, there are in reality several normal positions—several other positions which the uterus may occupy that are to be regarded as physiological, not pathological.

For example, as the bladder fills, the uterus is pushed backwards as a whole, rotating round an imaginary transverse axis. In technical language, it becomes retroverted. In Fig. 232, B, C, D indicate the positions successively occupied by the uterus as the bladder becomes more and more distended. When the bladder is emptied, the uterus returns to its original position of slight anteflexion, A.

Flexion of the uterus.—By a flexion of the uterus we mean that the long axis of the body of the uterus makes an angle, more or less obtuse according to the degree of flexion, with the long axis of the cervix. The angle is usually situated at the internal os.

In Fig. 231 the long axis of the body of the uterus meets the long axis of the cervix at about an angle of 120°.

Anteflexion.—When the angle formed by the meeting of these two axes is on the anterior aspect of the uterus, we have anteflexion.

Retroflexion.—When the angle is on the posterior aspect of the uterus, we have retroflexion.

Version of the uterus.—When the whole uterus is rotated round an imaginary transverse axis, without the position of the cervix and body relative to one another

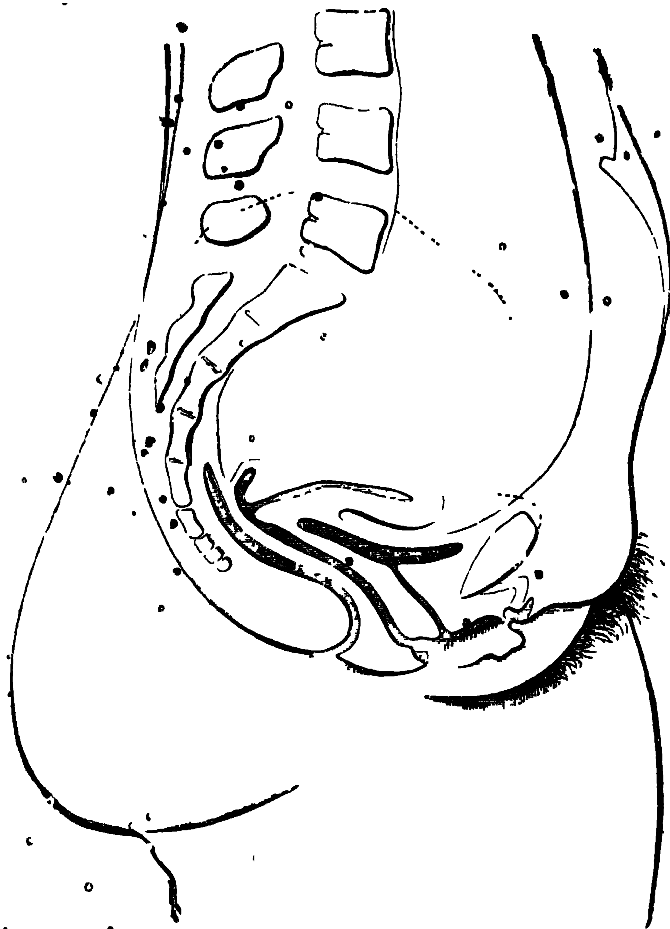


Fig. 231.—Showing the normal Shape and Position of the Virgin Uterus when the Bladder is empty (Schultze).

being altered, we have what is called a version of the uterus. If the rotation is forwards, *an anteversion*; if backwards, *a retroversion*.

Version and flexion may be combined in the same case. For instance, a uterus may be anteflexed and retroverted at the same time, the axis of the cervix making an angle with the axis of the body on the anterior aspect of the uterus, and then the whole organ being rotated backwards on an imaginary transverse axis.

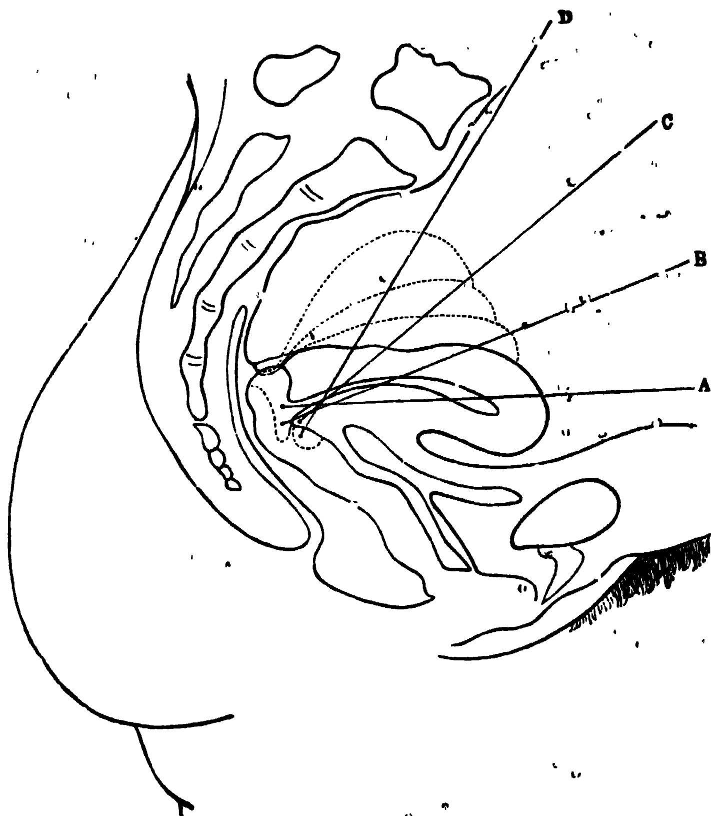


FIG. 232.—B, C, D. Positions successively occupied by the uterus as the bladder fills (Van de Warker).
A. Position of uterus with bladder empty.

Diagnosis.—Normally the external os is found looking downwards and backwards; and on bimanual examination, *if the bladder is empty*, the body of the uterus can be grasped between the internal finger and the fingers of the external hand.

In other words, on bimanual examination, when the uterus is in the normal position, the body of it can be felt through the anterior fornix; that is to say, the uterus is anteverted or anteflexed. Conversely, if the body of the uterus cannot be felt through the anterior fornix bimanually, the position of the uterus is not one of anteversion.

Two precautions are necessary to avoid error:—

1. The external hand must make pressure well above the situation where the body of the uterus may be expected to be if the position of the uterus be one of anteversion or anteflexion. The fingers of this hand must not, for example, press downwards close behind the pubes, or they may very probably be altogether in front of the body of the uterus, and meet the internal finger without the body of the uterus being grasped, even though it be anteverted or anteflexed. This mistake is a common one. Another somewhat similar mistake is omitting to make the pressure with the external fingers in the middle line. In this case also the external and internal fingers may be made to meet without grasping the body of the uterus, although it really lies in front.

2. The internal finger should make its pressure upwards *immediately* in front of the vaginal portion of the cervix, not some distance in front, or it will easily meet the external fingers without the body of the uterus being grasped.

It is well for the beginner to satisfy himself, in an undoubted case of anteversion or anteflexion, how all these mistakes can be made. They are certainly all commonly made by students beginning the study of the subject. The diagnosis may be confirmed by passing the sound, and finding that it enters with the concavity forwards. When the body of the uterus lies to the front, it is usually quite unnecessary to pass the sound for this purpose. The information obtained by the bimanual examination in practised hands is quite conclusive.

If an examination is made with the precautions mentioned, and the body of the uterus cannot be felt through the anterior fornix, but the internal and external fingers meet with only the abdominal wall, the vaginal wall, and the walls of the bladder between them, the body of the uterus does not lie to the front. It must, therefore, be

either retroverted (Fig. 236), anteflexed and retroverted (Fig. 235), or retroflexed and retroverted (Figs. 237 and 238).

Retroversion.—When this exists alone (Fig. 236), the physical signs are as follows:—The os uteri looks upwards and forwards; we can feel the body of the uterus through the posterior fornix; and, if the abdominal walls are very lax, we may be able to grasp the body of the uterus bimanually, even in this position. If there is no co-existing

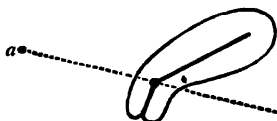


FIG. 233.—SLIGHT ANTEFLEXION—THE NORMAL POSITION.
a. Posterior aspect; *b.* Anterior aspect.

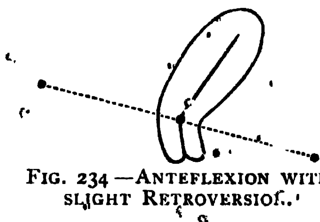


FIG. 234.—ANTEFLEXION WITH SLIGHT RETROVERSION.

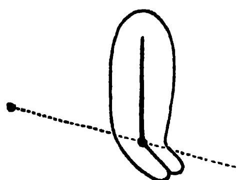


FIG. 235.—ANTEFLEXION WITH CONSIDERABLE RETROVERSION.

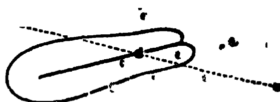


FIG. 236.—RETROVERSION WITHOUT ANY RETROFLEXION.

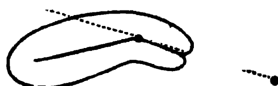


FIG. 237.—RETROVERSION AND SLIGHT RETROFLEXION.

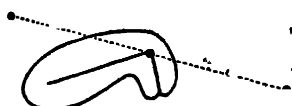


FIG. 238.—SLIGHT RETROVERSION AND MARKED RETROFLEXION.

Retroversion may occur:—
Alone (Fig. 236), or
Associated with anteflexion (Figs. 234 and 235), or
Associated with retroflexion (Figs. 237 and 238).
Retroflexion always has some retroversion combined with it (Figs. 237 and 238).

retroflexion, we find no angle at the point where the axis of the cervix meets the axis of the body of the uterus.

Retroflexion and retroversion.—Instead of the os uteri looking downwards and backwards, as it does normally, we find it looking more forwards than usual, but yet not so directly upwards and forwards as it does in pure retro-

version; we feel the body of the uterus through the posterior fornix, and we notice that there is an angle produced where the axis of the cervix meets that of the body (Figs. 237 and 238).

To make sure that a lump felt through the *posterior* fornix is the body of the uterus, we rely on the following considerations:—

1. The absence of the body of the uterus from the front as ascertained bimanually.

2. The lump felt through the posterior fornix moving with the cervix, and feeling continuous with it.

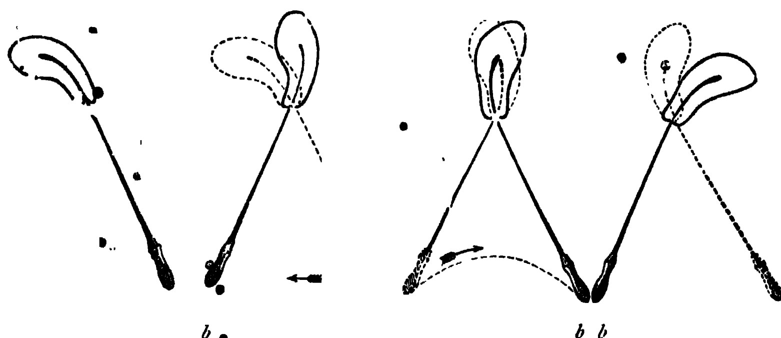


FIG. 239.—REPLACEMENT OF THE RETROVERTED OR RETROFLEXED UTERUS BY THE SOUND (Thorburn).

The first figure on the reader's left shows the sound passed into a retroflexed uterus.

The second figure on the left shows the first step of replacement, the handle of the sound carried back towards the perineum without reversing the curve (from *a* in the second figure to *b*), thus raising the uterus.

The third figure shows the "tour de maître" (see page 25), the handle of the sound being carried through a wide semi-circle from *a* to *b*, so as to bring the concavity of the sound forwards.

The replacement is completed by carrying the handle of the sound once more back towards the perineum, as in the end figure on the right.

3. Information obtained by passing the sound. If the lump is the body of the uterus, the sound passes with its concavity directed backwards, and we can recognise that it has entered the lump felt through the posterior fornix; moreover, if the lump is the body of the uterus, and there are no adhesions fixing it, we can replace the uterus with the sound (as shown in Fig. 239) into a position of anteversion, or anteflexion. After this has been done it will be

found that the lump previously felt through the posterior fornix has disappeared, and that on bimanual examination the body of the uterus can be grasped through the anterior fornix.

Attention to these points is needed to make certain that a lump felt through the posterior fornix is the body of the uterus, and not, for instance :—

A fæcal accumulation, or

A fibroid tumour growing from the posterior wall of the uterus, or

An enlarged and prolapsed ovary, or

A dilated Fallopian tube, or

A swelling due to hæmatocele or inflammatory exudation.

Retroversion or retroflexion with incarceration of the body of the uterus in Douglas' pouch.—In many cases of retroversion and retroflexion we find that the uterus is as movable as it normally should be. If, however, it happens that the size of the body of the uterus is such that when forced down into Douglas' pouch the uterus fits tightly there, we have the condition known as *retroversion, or retroflexion, with incarceration.* The uterus in such cases is fixed. The utero-sacral ligaments, which form the edges of Douglas' pouch, play an active part in retaining the body of the uterus in its incarcerated position. They contain muscular fibres, and can therefore exercise a certain amount of grip on the uterus, keeping it in Douglas' pouch, when it has once been pushed there.

ETIOLOGY.

Forward displacements.—The view taken here that forward displacements of the uterus (anteversion and anteflexion) have in themselves no pathological significance, renders it unnecessary to dwell at length on their etiology. It has already been said that the normal position of the uterus in the virgin, when the bladder is empty, is one of anteversion together with anteflexion, so that the axis of the body of the uterus forms an angle with the axis of the cervix on the anterior aspect of the uterus, the angle being an obtuse angle, and its value about 120°. Sometimes the

angle is a much smaller one, and it may even be an acute angle.

An exaggerated anteflexion of this kind is met with :—

1. *In cases where the uterus is ill-developed.*—Here we shall be able to make out that the uterus as a whole is small, for example, perhaps only one inch and a half long.

2. *In cases where there has been pelvic peritonitis*, and the excessive anteflexion has been produced by the dragging of adhesions. Here there will be probably a history of the inflammatory attack to guide us, and some evidence of it on physical examination : for instance, diminished mobility of the uterus.

3. *In cases where there has been cellulitis in the utero-sacral ligaments.*—As the inflammatory exudation contracts, it pulls on the uterus at the junction of the cervix and the body, the force acting in a backward direction; it is obvious how this will tend to produce an exaggerated degree of anteflexion. The mobility of the uterus will probably here also be diminished.

In the first group of cases it is not the anteflexion, but the want of development, that is of chief importance; and in the second and third groups it is not the anteflexion, but the pelvic inflammation, that is the pathological factor to be reckoned with.

Backward displacements.—It has been already said that retroversion to a moderate degree is physiological, inasmuch as it occurs every time the bladder fills. We may speak of this as "physiological retroversion." Retroflexion is occasionally congenital, but more rarely so than excessive anteflexion.

Retroversion in excess of the physiological retroversion just spoken of, and retroflexion, are usually acquired.

They generally imply, at least when present to any marked degree, a certain amount of descent of the uterus also; their mode of causation is therefore in many cases identical with that of uterine prolapse (see Chapter VIII.). Retroversion and retroflexion may also be caused by the dragging of adhesions, the result of pelvic peritonitis; in such cases the mobility of the uterus will be diminished or lost, and it will be impossible without using an undue amount

of force to replace the uterus into a position of anteversion or anteflexion with the sound.

Significance of versions.—*Anteversion* in itself has no pathological significance; if the mobility of the uterus is diminished, there has probably been pelvic inflammation, which is to be considered the important feature in the case.

Retroversion in excess of physiological retroversion, as we have seen, usually indicates some descent of the uterus, which under ordinary circumstances becomes retroverted as it prolapses. If the mobility of the uterus is lost, or diminished, and the uterus cannot be replaced with the sound, we are justified in considering that there has been pelvic peritonitis, and that the altered position of the uterus has probably been caused by it; however this may be, it is the pelvic peritonitis, and not the retroversion, that is the important feature of such a case.

So long as the uterus is freely movable, and not enlarged to any extent, retroversion of the non-pregnant uterus usually leads to no symptoms; there are some cases, however, where disorders of micturition (frequent desire to pass water, or incontinence of urine) are met with, associated with retroverted uterus; in cases of this kind the uterus is, as a rule, not quite of the normal size, but somewhat enlarged. In such cases it is desirable, at all events, to try the effect of replacing the uterus, and to insert a ring pessary to keep it from becoming again retroverted.

When the retroverted uterus is incarcerated in Douglas' pouch, some of the following symptoms are usually present:—

Bearing-down pain in the lower part of the abdomen and back.

Dysmenorrhœa.

Menorrhagia.

Trouble connected with micturition, or defæcation.

Here it is the *incarceration* of the uterus, not the mere retroversion, that is important.

Whether marked symptoms exist, or not, will depend on the tightness with which the uterus is gripped in Douglas' pouch.

Significance of flexions.—Flexions have been considered to have a pathological significance chiefly for two reasons:—

1. Because it has been thought that at the angle of flexion there was an obstruction to the circulation, so that the body and fundus of the uterus became congested—flexion of the uterus was thought to cause congestion of the body and fundus.

2. It was supposed that the canal of the uterus was narrowed at the angle of flexion, usually at the internal os uteri, so that an obstruction was produced at that point—flexion was thought to cause obstruction of the uterine channel.

I. The first proposition—*that flexion causes uterine con-*

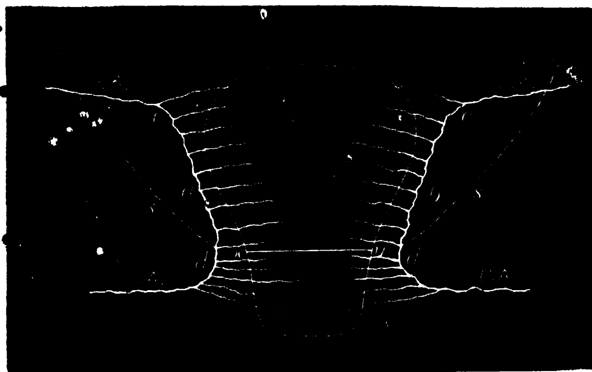


FIG 240.—DIAGRAM TO SHOW THE POSITION OF THE BLOOD VESSELS SUPPLYING THE UTERUS (after Hyrtl)

O A. Ovarian artery; *U A* Uterine artery; *c d* Lateral arterial channel on each side; *a b.* One of the transverse branches given off from this lateral channel; *x y* Indicates roughly the position of the internal os; *u s*, *u s*. Show position of pressure on each broad ligament when the uterus is incarcerated in Douglas' pouch

gestion—must be regarded as disproved chiefly for the following reasons * :—

1. Owing to the arrangements of the vessels supplying the uterus, it is impossible that flexion can interfere in any way with the return of blood from the body and fundus of the uterus along the broad ligaments. This will be clear from the accompanying diagram (Fig. 240).

* The account in the text is based on a paper by Sir John Williams, "On the Circulation in the Uterus," in vol. xxvii of the *Transactions of the Obstetrical Society of London.*

The ovarian artery reaches the uterus near the fundus on each side; as it nears the uterus it divides into two branches, one of which descends to join the uterine artery.

Thus there is, as it were, a lateral arterial channel, *c d*, *c d*, on each side, from which branches are given off that have a general transverse direction over the uterus with a slight inclination upwards.

These transverse branches join corresponding branches from the opposite side. From these transverse branches secondary smaller branches are given off towards the mucous surface of the uterus in a direction perpendicular to the plane of the paper. The veins have a similar arrangement. It will thus be seen that *each transverse section of the uterus has its own vascular supply*, and that a constriction in the

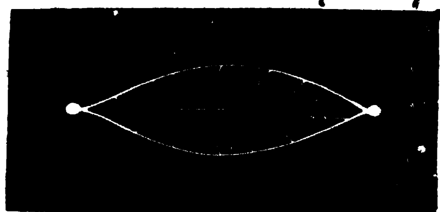


FIG. 241.—Transverse Section of Uterus, showing the arrangement of uterine arteries, the arterial circles formed by their primary branches, and the branches of the latter supplying the mucous membrane (Sir John Williams). The large white dot at each side of the figure corresponds to a transverse section of the lateral arterial channel, *c d*, in the preceding figure.

situation of *x y*, about the level of the internal os, the usual situation of flexion, cannot affect the circulation of the uterus above or below.

When the uterus is incarcerated in Douglas' pouch, congestion of the body and fundus does occur, but here the obstruction is to the return of the blood along *the broad ligament on each side*—the edges of the pouch pressing on the broad ligaments in the situation *u s*, *u s*, on each side. It is not the retroflexion causing obstruction at the angle of flexion, but the pressure of the edges of Douglas' pouch on the broad ligaments, that causes obstruction.

2. If flexion caused congestion, we should expect to have excessive menstruation in cases of flexion. Now, cases are

constantly met with in practice where there is marked flexion, retro- or anteflexion, and yet there is no menorrhagia.

3. Though we speak of the angle of flexion, it is rather because the term is a convenient one than that there is any actual angle; what is usually spoken of as "an angle" is really rather a simple curve; owing to the thickness of the walls of the uterus, when the body is bent on the cervix, the intervening part of the uterus forms a curve, not an angle.

4. In the paper already referred to it was shown that when the fundus of the uterus was stitched to the cervix the vessels could be as well injected artificially as when nothing of the sort had been done.

II. *As to the relation of flexion to obstruction of the uterine canal.*

What has been said as to the angle of flexion being rather a curve than an angle applies here also. The direction of the canal is altered by the flexion, but that is all. The late Dr. Matthews Duncan, speaking of a specimen of an acutely flexed uterus, remarked that the flow of the menses out of it would not be "nearly so much obstructed as the passage of the water along a bend of the river Thames."

Obstruction caused by flexion has been considered of importance:—

1. As a cause of dysmenorrhœa.
2. As a cause of sterility.

1. *The supposed obstruction as a cause of dysmenorrhœa.*— The explanation of the pain on this hypothesis is that it is caused by obstruction; excessive contractions of the uterus are set up to drive the menstrual fluid past the obstruction.

It has been shown above, from the examination of specimens, that in flexed uteri the direction of the channel is altered, but that the channel itself is not appreciably obstructed. Clinical evidence shows that flexion is about equally common in patients with dysmenorrhœa, and in cases without dysmenorrhœa, as the statistics given in the following passage from Hart and Barbour show:—

"Herman and Vedeler have shown that the connection between anteflexion and dysmenorrhœa has been over-

estimated. In his very interesting paper on the cause of dysmenorrhœa, Vedeler reports on a large number of cases (observed by himself) of patients with and without dysmenorrhœa. To ascertain the relation of this symptom to anteflexion, we extract from his tables all the cases of nulliparæ with uterus to the front; we take nulliparous cases only, because parity in itself affects anteflexion; and consider cases with uteri to the front as we are dealing with anteflexion only. We find that 37·3 per cent. (25 out of 67) of patients with dysmenorrhœa had a well-marked anteflexion, and that 33·3 per cent. (46 out of 138) of patients without dysmenorrhœa also had a well-marked anteflexion" (*Manual of Gynæcology*, 3rd edit., p. 335).

Further, in many of the worst cases of dysmenorrhœa the sound can be passed quite easily, showing the absence of any obstruction.

2. *As a cause of sterility.*—Just as there is practically no obstruction to the exit of menstrual fluid at the angle of flexion, so there is none to the entrance of spermatozoa.

Treatment of versions and flexions.—Anteversion and anteflexion require no treatment. Any symptoms present must be referred to some associated morbid condition, *e.g.* pelvic inflammation, recent or old, and not to the anteversion or anteflexion. When there is retroversion or retroflexion, with incarceration of the uterus in Douglas' pouch, the condition is to be looked upon as a pathological one, and remedied. The bladder should be emptied, and the uterus replaced with the sound; a suitable pessary, either an elastic ring or a Hodge's pessary, should then be inserted to prevent the displacement recurring. So long as the uterus is freely movable, any existing flexion should be regarded as having in itself no pathological importance.

Marked retroflexion, without incarceration of the uterus in Douglas' pouch, is usually to be taken as an indication that the uterus is lower than normal—that it is somewhat prolapsed. In such cases the treatment is that suitable for a case of slight prolapse; it is well to replace the uterus, so that the body of it lies to the front, before inserting a pessary. We shall then be able to know whether the pessary is efficient or not by subsequent examination. If it is efficient, the

uterus will be to the front; if it is not efficient, the displacement will have recurred.

It is well to understand clearly that no vaginal pessary, whether it be a ring pessary or a Hodge's pessary, or any other, can straighten or keep straight a flexed uterus. The only pessary that can do this (were it of any importance to do it) is an intra-uterine stem pessary, *i.e.* a pessary that has a straight rigid rod occupying the canal of the cervix and body of the uterus.

If a patient, complaining of pelvic pain, says that it is distinctly relieved by lying down, it is often worth trying if a pessary that tends to keep the uterus at a higher level

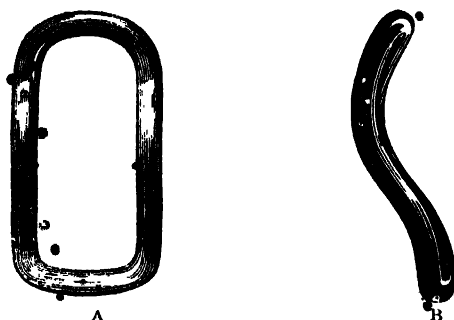


FIG. 242.—HODGE'S PESSARY.

A. Front view. B. Side view.

will relieve her. For this purpose the ordinary ring pessary is the best.

In such cases the relief obtained is due to removal of passive congestion by raising the uterus as a whole, and by lessening the tension on the various uterine supports.

Some general remarks on vaginal pessaries.—For all ordinary cases, where the use of a vaginal pessary is indicated, either the ring pessary made of watch-spring covered with india-rubber, or Hodge's pessary, will be found to meet every requirement.

Several sizes of each should be at hand. Hodge's pessary is made of many different materials: for example, vulcanite, celluloid, or copper wire, covered with india-rubber.

The action of the watch-spring pessary, and the mode of inserting it, have been mentioned on page 147.

Position of Hodge's pessary.—Hodge's pessary should lie with the concavity of the upper curve directed forwards. The pessary should not be pressing firmly against any bony part, but should simply be grasped by the vaginal walls.

Action of Hodge's pessary.—The upper limb of Hodge's pessary pulls the vaginal wall at its insertion posteriorly into the cervix in a backward direction, and so tends to throw the weight, the body of the uterus, forwards, the fulcrum lying somewhere between these two parts.

To insert a Hodge's pessary.—One finger of the left hand retracts the perineum slightly; the pessary, held in the right hand, is passed through the orifice of the vulva, the bar closing the upper end of the pessary parallel to the cleft between the labia. When the pessary is in the vagina, it is turned round through a quarter of a circle, so that the upper bar lies transversely in the vagina. The upper end has a tendency to find its way into the anterior fornix; and care must, therefore, be taken to hook it with the forefinger behind the cervix into the posterior fornix.

Whenever a pessary has been inserted, the patient should be told that she is wearing an instrument, and shown one of the kind she is wearing; and she should be warned that it should not on any account be left unchanged for a longer period than *three* months at a time. In general it is best to see her again in the course of a few days, to know if the pessary is comfortable. If then all is right, she need not be seen again for *three* months. A patient wearing a pessary should always be directed to use a vaginal douche of some antiseptic lotion night and morning.

If a pessary be used that fits too tightly, it will very likely cause ulceration; and in neglected cases even vesico-vaginal fistula may be produced. It is well to see that the diameter of the pessary at every part of it is a relatively broad one, so as to distribute the pressure over a broad surface rather than over a narrow one.

In fact, the nearer any part of a pessary approaches in character to anything like an "edge," the greater the probability of it causing ulceration.

Zwanke's pessary, sometimes known as the butterfly pessary, has two wings attached to metal rods, the ends of which can be fixed together by a screw-cap. When this is the case, the "wings" of the pessary are expanded. When the wings are closed, the ends of the rods are widely divergent. It is introduced in this state into the vagina; then the wings are opened by bringing together the rods and fixing them by the screw. The patient takes out the pessary at night, and replaces it in the morning. It is a very efficacious instrument for many cases of prolapse. The edges of the "wings" should be very thick and rounded. The patient should be warned of the danger of leaving the pessary in for an indefinite time.

I have known a large vesico-vaginal fistula produced by leaving a Zwanke's pessary for a long period unattended to in the vagina. The patient was an old woman, who had worn the pessary many years for prolapse with great comfort. Then she got rheumatoid arthritis in her fingers, and was unable to turn the screw of the instrument; and so it came about that the pessary was worn many months without being removed. About three weeks before I saw her, she began to find her water coming away, making her constantly wet. She then went to a medical man, who was unable to remove the instrument. She then came to the London Hospital. One wing of the pessary was found lying in the bladder, and encrusted with phosphates. On separating the metal rods widely, the pessary was easily removed.

I have also had to remove a Greenhalgh's pessary that had been in the vagina ten years without being taken out.

This form of pessary is shaped like Hodge's, but the lower cross-bar is formed of india-rubber *only*, the rest of the pessary consisting of copper-wire covered with india-rubber. In this case one lateral half of the pessary was deeply embedded in the soft tissues, and had to be, as it were, dug out. After removal, a trench was left as broad and deep as to contain the little finger; but it is worth noticing that in this case no vesico-vaginal fistula had been produced.

Inversion of the uterus.—This is a very rare displacement. It may be either *acute* or *chronic.* The acute variety

almost always occurs as a complication of the third stage of labour; exceptionally it may be produced by the dragging of a growth such as a submucous fibroid tumour, or fibroid polypus, attached to the fundus of the uterus, or by traction on such a polypus while it is being removed.

The chronic form is a sequel of the acute, when the

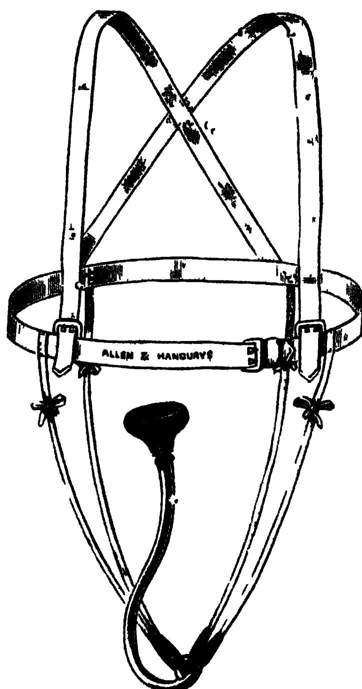


FIG. 243.—AVELING'S REPOSITOR—AN INSTRUMENT FOR REPLACING AN INVERTED UTERUS BY CONSTANT ELASTIC PRESSURE.

patient has survived the immediate consequences of the accident.

Pathology.—Relaxation of the fundus and neighbouring part of the uterus is a necessary condition for the production of inversion. Given this relaxation, then either pressure from above, or traction on the fundus from below may cause inversion. Instances of traction from below are (*a*) pulling on the cord in cases of adherent placenta, (*d*) dragging of a fibroid polypus adherent to the fundus, or its neighbour-

PLATE XV.



FIG. 1.—INVERSION OF THE UTERUS.

Caused by dragging of a fibroid polypus attached to the fundus The polypus has been removed. The rectum is opened down to the anus, and is pushed to the left. A "window" has been cut in the posterior vaginal wall high up, showing the convex swelling formed by the inverted uterus.

Plate XVI. (see opposite).

FIG. 2.—INVERSION OF THE UTERUS.

The same specimen as in the preceding figure, seen from the front. The bladder and urethra have been laid open and are seen to be distinct from the inversion.

FIG. 3.—INVERSION OF THE UTERUS.

The same specimen as in the preceding figures, seen from the peritoneal aspect, showing the funnel-shaped cavity produced by the inversion. The ovaries are seen near the upper margin of the "cup."

PLATE XVI.

FIG. 2.



FIG. 3.—INVERSION OF THE UTERUS.
For description see opposite page.

hood. An example of pressure from above, causing inversion, is where sudden pressure is made on the uterus with the hand in the third stage of labour, the uterus at the moment happening to be relaxed. Hence the importance of the practical rule in regard to expression of the placenta, viz. only to make efforts to express it when the uterus is felt to be hard, *i.e.* contracted.

Degrees of inversion.—It is usual to divide cases of inversion into groups:—

1. Where an inversion exists, but the inverted fundus has not passed the os uteri;
2. Where the inverted fundus has passed through the os; and
3. Where the whole uterus is turned inside out, cervix as well as body.

Symptoms.—In the acute variety there is severe shock, and there may be hæmorrhage. In the chronic form symptoms may in rare cases be absent;* usually, however, there is more or less bearing down, and the patient loses an excessive amount of blood (menorrhagia and metrorrhagia). When she is not losing blood, there is a yellow discharge, owing to inflammation of the exposed mucous membrane of the uterus.

Physical signs and diagnosis.—These have been considered under the diagnosis of fibroid polypi (p. 222).

Treatment.—The treatment of acute cases occurring during labour belongs to Midwifery. In chronic cases we may try to effect replacement, either with the hand alone, or by pressure exerted by some instrument guided by the hand, or we may try the effect of constant elastic pressure on the inverted uterus.

An instrument on the principle of, and somewhat resembling, a cup-and-stem pessary is used. The cup is made of vulcanite, and is adapted to the inverted fundus. Any desired degree of upward pressure is then obtained by tightening up the elastic bands. Straps passing over the shoulders fix the waist-belt. The best instrument for the purpose is that known as Aveling's repositor. It hardly ever fails. This method may be used for two or three

* As in a case (quoted by Dr. West) observed by Madame Boivin.

weeks, the patient remaining in bed, and the instrument being frequently examined to see it is in proper position; pain is, if necessary, relieved by hypodermic injections of morphine.

Should this treatment fail, we may try manipulation under chloroform, and we may either use the hand alone or use White's repositor, guided by the hand. If the hand alone is used, we should try to replace first the part last inverted. Dr. West refers to a case of thirteen years'

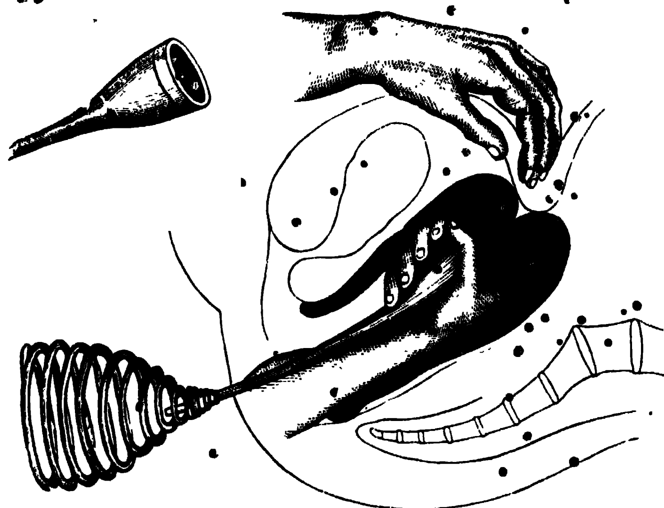


FIG. 244.—WHITE'S REPOSITOR, WITH SPIRAL SPRING TO PLACE AGAINST THE OPERATOR'S CHEST (Thorburn).

standing, where Noeggerath succeeded in replacing the uterus by manipulation with the hand alone.

In cases where Aveling's repositor fails, or where the patient cannot bear the pain and discomfort incidental to the use of this instrument, I should be inclined at the present time to open the abdomen and incise the ring of the cervix posteriorly, when most probably reduction of the inverted fundus would easily be effected.

Cases of chronic inversion are so rare that no gynæcologist sees many of them. In all the cases I have seen I believe Aveling's repositor was successful. Some of its drawbacks,

discomfort and pain, have been mentioned; also after the inversion has been reduced there is sometimes difficulty in removing the cup of the repositor, and the cervix may possibly be torn during the process, even so deeply as to involve the peritoneal cavity. As the instrument can hardly be completely aseptic after some days in the vagina, the consequences of such a tear may be very serious. On the whole I think at the present time laparotomy and incision of the cervical ring from above is the best treatment.

CHAPTER XVIII.

DISORDERS OF MICTURITION.

THE significance of the following symptoms will be shortly considered :—

Frequent desire to pass water.
Pain on passing it.
Difficulty in passing it.
Retention of urine.
Incontinence of urine.

It is important to bear in mind that such symptoms may be due either to :—

(1) Some disease or abnormality of the urinary tract itself, including alterations in the quantity or character of the urine ;

Or (2) morbid conditions of other parts—the urinary tract itself not being diseased, or at least not primarily so.

I. Abnormal conditions of the urinary organs, or of the urine, causing disorders of micturition.

a. Diseases of the urethra.

Urethritis, Vascular caruncle — Common.
Malignant disease, Stricture — Rare.

Frequent desire to pass water and pain on passing it are the chief symptoms ; occasionally there may be retention, which is partly voluntary in some cases from fear of the pain accompanying micturition.

b. Diseases of the bladder.

Cystitis and its various causes, gonorrhœa, foreign bodies in the bladder (hair-pins, &c.), vesical calculi, imperfect asepsis in catheterization.

According to Dudley, the bacillus coli communis, the gonococcus, and the bacillus tuberculosis are the pathogenic organisms most frequently concerned in producing cystitis. The bacillus coli communis is actually the one most often found.

Malignant disease.—Primary (rare), secondary to malignant disease of uterus (common).

Frequent desire to pass water, and pain in passing it, are the prominent symptoms.

Vesico-vaginal or vesico-uterine fistula.—The characteristic symptom here is, of course, incontinence of urine.

c. Alterations in the urine.

Quantity.—If an excessive quantity of urine is secreted, as in diabetes, and some cases of hysteria, the bladder being frequently filled, there will be frequent calls to empty it. In these cases there is frequent micturition, but not painful micturition.

Quality.—When the urine contains "gravel," the bladder is irritated mechanically; in such cases micturition is painful as well as frequent.

d. Diseases of the pelvis of the kidney, or of the kidney itself.—Tubercular disease of the kidney and pelvis of the kidney are perhaps the conditions most likely for a time to be overlooked, and the case regarded as one of cystitis.

Two cases in illustration of this are added at the end of the chapter. Malignant disease of the kidney also requires mention under this heading.

Infection by the bacillus coli appears to be a frequent cause of pyelitis, judging by the frequency with which this organism is found in specimens of urine sent for bacteriological examination.

Calculus in the kidney or pelvis of the kidney must also be thought of. A radiograph should be obtained, if calculus is suspected.

II. Abnormal conditions outside the urinary tract causing disorders of micturition.

a. Pelvic inflammation, including pelvic peritonitis, pelvic cellulitis, and ovaritis.

These may lead to pain on passing water, and frequent desire to pass it.

b. Pressure.—When the uterus is not enlarged, so long as it is freely movable, neither its anteflexion nor retroflexion disturbs the function of micturition; when the uterus is enlarged, however, the case is different.

If the enlarged uterus occupy a position of anteversion or anteflexion, we may have frequent desire to pass water, and sometimes involuntary passage of a small quantity of urine. Cases of this kind are met with during pregnancy, and also where the uterus is enlarged owing to the presence of fibroid tumours.

If the enlarged uterus occupy a position of retroversion or retroflexion, we may have disturbances of micturition, viz., frequent micturition, incontinence of urine, or retention.

The best example of micturition being interfered with by an enlarged retroverted uterus is retention of urine in cases of retroverted gravid uterus.

When there is retroversion or retroflexion of the gravid uterus, the uterus may rise out of the pelvis at the proper time (the beginning of the fourth month), and so the malposition be spontaneously rectified; sometimes, however, it does not do so, but becomes *incarcerated*; retention of urine then occurs.

This is due partly to the urethra being dragged upwards by the cervix, which is displaced high up behind the pubes, and partly to direct pressure on the urethra. Often there is some dribbling over of urine from the distended bladder, which may mislead the patient into thinking she is passing her water properly. In cases of this kind the degree of distention reached may be very great. For example, in several cases of the kind I have drawn off more than 100 ounces of urine, and in the following case, in every way a very typical one, 126 ounces:—

J. R., aged 35, had had nine children, the last two years and two months ago. She was brought to the London Hospital on Wednesday, April 15, 1891, with the following history:—She had been in her usual health up to 2 a.m. on the morning of the previous Sunday, April 12, when on getting out of bed to pass her water she found herself unable to do so. She had pain in the lower abdomen for about half an hour before making the attempt to pass water. The pain increased after the ineffectual effort to micturate. She went back to bed, and stayed there. A doctor was called in, who gave her some medicine. She was only able to pass water

once, and then very little and after great straining, between 2 a.m. on the 12th, and the afternoon of the 15th, when she was brought to the Hospital. On inquiry it appeared that she had suckled the last child for one year and eight months, and that she had been last "unwell" soon after Christmas, 1890, since which time she had not menstruated. Before Christmas she had been for some time regular every three weeks, the period lasting three days.

April 15, 1891.—*Abdominal examination.*—There is a tense, uniform, centrally situated swelling reaching about a hand's breadth above the umbilicus, dull on percussion and containing fluid. Nothing heard over it. Patient is evidently in great pain.

Vaginal examination.—Vulva and vaginal mucous membrane blue. Vaginal portion of the cervix high up above the pubes, and out of reach. Posterior vaginal wall bulged down by a soft swelling.

A catheter was easily passed, and 126 ounces of urine were drawn off, after which the tumour in the abdomen was found to have disappeared. The patient was admitted into the Hospital. On the following morning, *April* 16, the resident accoucheur, Mr. Calthrop, found that the uterus was still retroverted, and 80 ounces of urine were drawn off. At my visit in the afternoon of the same day I examined the patient, and found that the uterus had of itself gone into its proper position, the os uteri then looking downwards and backwards. After this the patient was able to pass her water naturally. The urine contained no albumen (except a trace on one occasion), but hyaline and granular casts were found several times.

After emptying the bladder in cases of this kind we may either (1) replace the uterus immediately, under chloroform if necessary, or (2) keep the patient at rest in bed for a few days, at the same time taking care that the bladder is regularly emptied every six hours. In most cases, as in the one of which an account has just been given, the uterus will then rise out of the pelvis of itself. In some cases the urine first drawn off is dark, like porter, and contains an abundance of blood, probably from sloughing of the vesical mucous membrane. Indeed in some cases a cast of the bladder may be passed. I have seen several examples of this.

Ovarian tumours very rarely cause retention of urine, but they do occasionally. I have met with some instances of this.

Fibroid tumours of the uterus, on the other hand, often cause retention; and when this has been relieved, it does not necessarily recur, at least for some time. It is only fibroids of a size to fit the pelvis rather tightly which cause retention of urine; that is to say, fibroids which form a

tumour equal in size to that of the pregnant uterus at the end of the third month.

Retention of urine may occur in advanced cases of *malignant disease of the cervix* involving the vagina. I have met with a case of this kind where five pints of urine were drawn off. The retention did not recur during the time the case was under observation. I have also seen a similar case where the distended bladder was mistaken for an ovarian cyst.

Malignant tumours originating in the pelvis may cause frequent and painful micturition.

Tumours in the vagina, whether originating there or elsewhere, may also interfere with micturition.

c. Hysteria may cause retention of urine, or lead to frequent micturition, owing to an unusually large quantity of urine being secreted; sometimes, however, in such cases absolutely less urine than normal is secreted.

d. Labour.—Difficulty in passing water, or complete inability to pass it, may occur after labour, due to the bruising or laceration of the parts in the neighbourhood of the urethra.

e. Procidentia.—Difficulty in passing water is not infrequently present; often the patient has found that by pressing the parts up she can pass water more easily.

f. Cystocele.—In many cases of cystocele the patient finds that she has a troublesome slight incontinence of urine from time to time. When this is so, Dudley's operation for this may be combined with the ordinary colporrhaphy. The points of this operation can be appreciated by looking at Figs. 64, 65, 66.

Diagnosis.—The chief point to be considered at first is whether the symptoms are due to morbid conditions of the urinary tract, or of the urine; or to morbid conditions elsewhere—whether, in fact, the cause is in Group I. or Group II.

Some of the causes in Group I., such as vascular caruncle, stricture of the urethra (if the stricture is at the urethral orifice, as most often happens), and urethritis, are diagnosed by inspection.

Careful examination of the urine is of great importance;

PLATE XVII.



RADIOGRAPH OF A PATIENT WITH A HAIRPIN IN THE BLADDER.
(From a case of the Author's.)

Note the almost horizontal position of the hairpin, in which position it would most naturally tend to lie: compare this with the radiograph of a hairpin in the uterus, where the hairpin is more or less vertical in position (Plate VI., p. 176).

In the above case the urethra was dilated with Hegar's dilators, and the hairpin removed by seizing its *blunt* end with Wells' forceps.

and it should be drawn off with a catheter for the purpose, to avoid contamination with vaginal discharges. In some cases it will be well to have a bacteriological examination made in addition to the ordinary clinical tests.

Bleeding caused by passing the catheter probably means malignant disease of the bladder; fragments of the growth in such cases may come away in the eye of the catheter. The diagnosis would be completed by dilating the urethra with Hegar's dilators, and passing the finger into the bladder.

The sound * should be passed into the bladder, and search made for foreign bodies, or calculi. The distance the sound can be passed into the bladder, measured from the external orifice of the urethra, should be noted; normally it passes four and a half inches. This measurement is diminished in various diseases, particularly acute and subacute cystitis.

When the presence of a foreign body in the bladder is suspected, it is well to have a radiograph taken. (See Plate XVII.)

Tenderness on passing the sound also indicates disease of the bladder.

On vaginal examination, if we find there is special tenderness when pressure is made on the anterior vaginal wall, this may indicate cystitis.

When the urine contains pus, and is *acid*, the cause may be acute or subacute cystitis, or pyelitis. In chronic cystitis the urine is alkaline.

It must not be forgotten that pus in the urine may be due to a pelvic abscess opening into the bladder, or to a periurethral abscess opening into the urethra. I have seen a case of this; the abscess formed a swelling about the size of a walnut in the anterior wall of the vagina below the urethra. Pressure on the swelling caused pus to flow from the urethra. A counter opening was made at the most dependent part through the anterior vaginal wall. The cavity soon filled up, and no incontinence of urine resulted.

When it seems probable that there is disease of the urinary tract itself, the possibility that a cystoscopic examination of the bladder may be useful should be borne in mind.

Dr. Howard Kelly, of Baltimore, has successfully prac-

* The ordinary uterine sound answers the purpose very well.

tised catheterization of the ureters, and has devised a special cystoscope and sounds for the purpose. With the aid of the cystoscope the ureteral sound can be passed into the orifice of the ureter under the direct guidance of the eye.

The cystoscope, however, is not an especially gynæcological instrument. As much practice with it is needed to become expert, it seems better, when the evidence points to the cause of the urinary symptoms being some morbid condition of the urinary tract itself, and to the desirability of having a cystoscopic examination, to send the patient to a surgeon with special experience in urinary disorders.

The existence of a vesico-vaginal or vesico-uterine fistula, and its position, can be demonstrated by pouring (sterilized) milk into the bladder while we are looking into the vagina with Sims' speculum, the patient being in the lithotomy position.

Coming now to Group II., we need only say that pelvic peritonitis and cellulitis, enlargements of the uterus, ovarian and other tumours, will necessarily be discovered by a careful physical examination; and as regards hysteria, we shall be guided to a diagnosis by an absence of local physical signs, combined with the general appearance and bearing of the patient.

Sometimes, apart from hysteria and apart from any discoverable disease, local or general, congenital incontinence is met with, persisting even up to seventeen or eighteen, or later, and resisting all treatment, as in the following case:—

J. W., aged 17, was admitted into the London Hospital on account of inability to hold her water since birth.

December 29, 1888.—She attended first in the out-patient department for a short time. The uterus was found retroverted, not enlarged, and freely movable. It was placed in a position of anteversion with the sound, and a ring pessary inserted. Incontinence continued as badly as before. Ring removed, and patient admitted. There was simple erythematous vulvitis, and also soreness and redness of the skin round the vulva, so that there was no doubt as to the reality of the incontinence. (In some cases where incontinence is complained of, there is no such vulvitis or condition of skin; then probably we may take it that the incontinence is trifling, and may be curable.)

January 5.—Bed always wet; patient passes her water voluntarily (1 oz.) every quarter of an hour; during night, three times. Blistering above the pubes. Large doses Tr. Belladon. tried without effect, also

cautery to urethral orifice and anterior vaginal wall for about 1 inch up. This latter caused a slight improvement till the soreness produced by the cautery disappeared, but the improvement was only temporary.

January 17.—Constant current; one pole, lumbar spine; the other over pubes ten minutes; same treatment till February 3; no better.

Went home to Blackwater absolutely without the least improvement. In other ways she seemed a sensible girl. (Urine, acid; albumen, 0; sugar, 0; sp. gr., 1010; sound to bladder, 4½ to 5 inches.)

Treatment.—The treatment suitable in each case will depend on the cause: for example, vascular caruncle must be removed; vesico-vaginal fistula operated on with a view to closing the fistula; ovarian tumours removed; foreign bodies, or calculi in the bladder, extracted; a tubercular kidney, if the disease is proved to be unilateral, may be extirpated. In cases of cystitis for which no cause can be discovered, rest in bed, with frequent hot hip baths, is useful. In some cases the bladder may be washed out two or three times a day with water containing ʒ ij. of liq. carbonis detergens to the pint. Washing out the bladder should not be employed as a routine measure, but only where medical treatment fails. It should not be persisted in long.

Dudley speaks well of washing out the bladder with two ounces of a 10 per cent emulsion of iodoform in oil of sesame. Afterwards he uses either silver nitrate solution, beginning with 1 per cent., or argyrol solution 1–5 per cent.—in each case replaced immediately by an injection of normal saline solution.

The best way of doing this is to use a catheter made of india-rubber, with a glass funnel fitted on the other end of the catheter. The bladder is first emptied with another catheter; then the india-rubber catheter is passed, and the solution to be used poured into the glass funnel. The quantity that can be introduced depends on the irritability of the bladder; perhaps only two or three drachms, or less, may be tolerated.

Large quantities of demulcent drinks, such as barley water, are useful. Where pain on passing water is a marked symptom, and is due to disease of the bladder, or urethra, urotropin, tincture of hyoscyamus, decoction of pareira, bicarbonate of potash, spiritus ætheris nitrosi and camphor

water, separately or in various combinations, may be prescribed. Oil of sandalwood in capsules, ℳ v.–xv., thrice daily, is also useful. It is often advantageous to give besides a mixture containing benzoate of ammonia in twenty-grain doses in combination with Tinct. Collinsonia Canadensis (ℳ xx.–xxx.), and buchu.

Goodell speaks highly of belladonna "in almost every form of vesical irritation."

His favourite formula is:—

℞. Atropin. Sulph. gr. ss.
Aq. destillat. ℥iv.

Four drops to be taken in a wineglassful of water before each meal. To be increased or diminished according to the constitutional effect.

For *nocturnal incontinence* in young girls we attend carefully to the state of the bowels. If the girl suffers from worms, suitable treatment is adopted; we advise the mother not to let her drink any fluids for two hours before she goes to bed; and she should be awakened to pass water when the mother is going to bed. Sometimes a blister applied above the pubes is efficacious; sometimes benefit is derived from small doses of tincture of belladona. Of course we are now speaking of cases where the urine is healthy, and there seems no reason for suspecting organic disease.

The following case is an example of the latent character of tubercular disease of the kidney. It was not suspected during life.

M.K., aged 30, was admitted into the London Hospital complaining of pain on micturition, and of having to pass her water frequently for the previous six weeks. The urine passed during this time had been milky. She had to get up at night to pass her water.

Had been troubled with cough and shortness of breath five months.

Had one child born dead; she thought it was at full term.

On admission the urine was found to contain a small quantity of pus, and was acid.

The case was thought to be one of sub-acute cystitis, and treated accordingly.

She died suddenly of syncope, apparently due to fright.

On post-mortem examination there was found advanced tubercular degeneration of the left kidney. The right kidney contained two small abscesses, but was for the most part healthy.

She had a typical kyphotic pelvis, the measurements of which are appended :—

Conjugate of the brim, 5¼ inches.

Transverse, 5¼ inches.

Conjugate at the outlet with the coccyx pushed back, 3½ inches.

Between ischial tuberosities, 3 inches.

Between ischial spines, 3⅝ inches.

Diagonal conjugate (*i.e.*, from the sacral promontory to the lower part border of the symphysis pubis), 6 inches.

The following case is an example of malignant disease affecting a movable kidney. The prominent symptoms were occasional hæmaturia; sometimes pain on micturition, apparently only when clots had to be passed; wasting, and the presence of a tumour in the abdomen.

M. B., aged 62, married at the age of 27, a widow since she was 40, had had six children. She was admitted into the London Hospital under my care on December 29, 1887, complaining of a tumour in her right side, and of having passed blood with her water.

History of the illness.—Nine or ten months ago she passed "blood instead of water." The next morning after getting up she was attacked with severe pain in the right iliac region and in the "stomach." She passed a motion, but this did not relieve the pain. A doctor who was called in declared the lump in her side to be a fæcal accumulation, and ordered her some aperient medicine, which gave her some relief.

Two or three months afterwards she again passed a large quantity of dark-coloured blood, together with a few clots. The passing of it was accompanied by a good deal of pain. Since then she had been losing flesh, and feeling weak.

She first felt pain on passing her water seven months ago, and had suffered from it occasionally since, especially six weeks ago, when it was of a severe cutting character. Until a month ago she had to get up at night to pass water, but lately she had not had to pass her water with undue frequency.

December 29.—In the right lumbar region there is felt a hard mass moving on respiration, and easily separable from the liver. It is very freely movable on manipulation. The mass feels solid, and like a movable kidney, only it is larger than a healthy kidney, and in places the surface of the kidney is somewhat nodular

It is not tender.

When the finger is laid lightly on the abdomen over the tumour, there is resonance, but less than in the corresponding iliac region. When the finger is pressed down on the surface of the tumour, the note obtained on percussion is dull.

Bladder—The sound passed 4½ inches into the bladder, measured from the external orifice of the urethra. No pain caused by passing it.

Urine.—Alkaline, sp. gr. 1008, smoky in colour, containing albumen: on standing a deposit formed, which was found to contain blood corpuscles and pus corpuscles.

On another occasion the urine was acid, and on standing gave a deposit in which blood corpuscles were seen, though the guaiacum test gave a negative result. I thought the case was one of malignant disease affecting a movable kidney, and transferred the case to the surgical side for operation.

The tumour was removed on January 20, 1888, and found to be what had been expected.

On cutting the kidney open there was seen a partially decolorized clot, forming a cast of the pelvis of the kidney. The malignant growth was in the form of white circumscribed nodules, the projection of which caused the unevenness of surface referred to above.

The patient unfortunately died of peritonitis a few days later.

Hæmaturia in the newly-married.—I have seen one remarkable case in which marked hæmaturia occurred soon after marriage. Of course, as a general rule, such a symptom is merely due to admixture of blood (resulting from lacerations of the hymen) with the urine; but in the case I refer to, the urine was drawn off with a catheter by myself, and found to contain a good deal of blood. It is not easy to explain how this hæmaturia originated—I merely record it as a matter of clinical interest.

CHAPTER XIX.

MALFORMATIONS.—STERILITY.

Malformations.—These will be merely mentioned, as they are all rare, and most of them very rare.

1. **Of the vulva.**—All malformations of the vulva are instances of arrested development. The following five figures

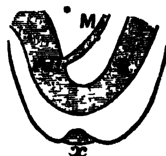


FIG. 245.

from Schroeder illustrate stages in the development of the vulva, terminating in the normal condition of parts (Fig. 249). Any one of the conditions represented in the first four figures may persist, and constitute a malformation.



FIG. 246.

In Fig. 245 we have the allantois, the rectum, and Müller's ducts communicating, but shut off from the exterior.

This condition, absence of the vulva, is found in some monstrous fœtuses.

In Fig. 246 a depression of the skin has established a communication with the exterior; but the rectum, bladder, and vagina open into a single passage.

There is a specimen from an adult in the London Hospital Museum illustrating this condition. In the specimen in question there is a double uterus and vagina.

The uterus and vagina on the right side are pervious, and



FIG 247

fulfilled their functions. The vagina on the left side is imperforate; the Fallopian tube on this side is dilated so as to form a large hæmatosalpinx. The rectum, urethra, and right-sided vagina open into a cloaca. The patient



FIG. 248

was a married woman, and it is said in the catalogue that her husband denied that his wife was in any way malformed.

In Fig 247 the tissues between the rectum and bladder are seen to be descending, so as to divide the common opening

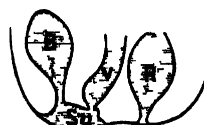


FIG 249

into an anterior part, the uro-genital sinus, and a posterior part, the anus.

In Fig. 248 the perineum has now been completely formed, but the bladder and vagina still open into a common opening, the uro-genital sinus.

In Fig. 249 the uro-genital sinus is divided, by descent of the tissues between the bladder and vagina, into an upper

part, the urethra, and a lower part, which forms the vestibule, thus completing the normal arrangement of the parts.

2. **Of the uterus.**—It is easy to understand the various malformations that occur, if it be borne in mind that the Fallopian tubes, the uterus, and vagina are developed from two tubes—Muller's ducts. These remain separate above, forming the Fallopian tubes, but below they coalesce, the septum between them being absorbed, to form the uterus and vagina.

The following malformations are described :—

1. *Uterus unicornis* —Here one of Muller's ducts has not developed (Fig. 250).

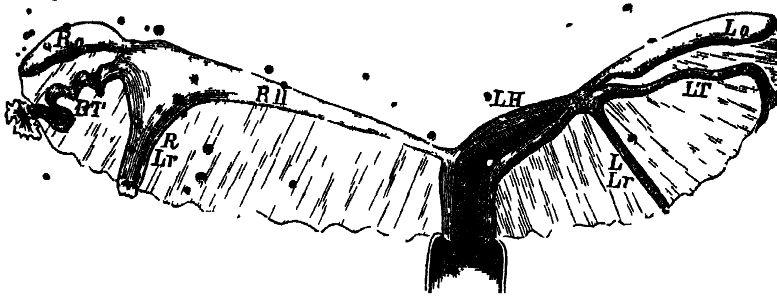


FIG 250 —UTERUS UNICORNIS (Schroeder).

LH, Lo, LT, LL Uterine horn, ovary, tube, and round ligament of the left side *RH, Ro, RT, RL* Those of the right side

2. *Uterus duplex.*—Both Muller's ducts have developed but they have not coalesced, the result being two almost distinct uteri, merely joining where they lie in contact.

3. *Uterus septus* —The external appearance is that of a normal uterus, but on section the uterine cavity is seen more or less slightly divided into two. The vagina may be single or double (Fig. 252).

A Case of Double Uterus with Submucous Fibroid Tumour.

A married woman, 38 years of age, was sent to me by Mr Snowman and admitted into the London Hospital under my care on October 16, 1895 She had been married fourteen years, but had never been pregnant. The catamenia appeared when she was fifteen, but she was not regular till she was twenty-one, several months intervening at times between the periods

Since she was twenty-one she had been quite regular every four weeks till seven months ago, but nearly always had some pain during menstruation. She complained that for the last seven months she had been losing too much at her periods, and for the last six months there had been a constant

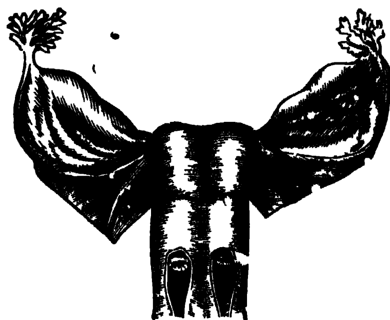


Fig 251 Uterus Duplex (Thomas)

red discharge between the periods, but till recently she could still tell when the menstrual periods occurred For the last six months she had passed clots during menstruation, but had never done so previously The dysmenorrhœa had been relieved during the past seven months by lying

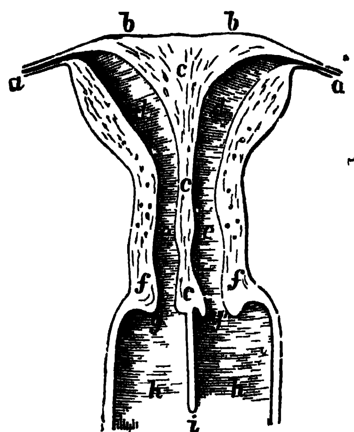


Fig. 252—Uterus Septus (Schroeder, after Kussmaul).

down, but this was said to have had no effect in lessening the excessive flow She had had some pain and smarting during micturition ever since her marriage, but this had been worse during the last seven months. She had been losing flesh during the last six months. On vaginal examination the

uterus was found considerably enlarged. A curious falciform fold of mucous membrane (F, Fig 253) was felt at the upper part of the vagina running from before backwards, and from right to left The sound passed 4½ inches At this time it was not recognised that there was a second vaginal portion, as the finger passed to the right of the fold just described After disinfecting the vagina, a laminaria tent, specially rendered aseptic by prolonged immersion in absolute alcohol containing 1 per cent of corrosive sublimate, was inserted into the cervix (A)—that on the right side—on October 16, at 5 p m, a strip of iodoform gauze being packed



Fig. 253—Uterus Septus (Author's case)

A, B Two separate vaginal portions, each with its external os uteri E Spur above which the septum has been absorbed C Cavity of uterus D Submucous fibroid attached at fundus F Falciform fold of mucous membrane described in notes of the case V Vagina

below the tent to keep it in position The next day, at 2 p m, an anæsthetic was given, and the patient placed in the lithotomy position The iodoform gauze was removed, and a vaginal douche of perchloride of mercury (1-1000) given The upper part of the vagina and cervix into which the tent had been inserted were then thoroughly exposed with Sims speculum and retractor It was then seen that there was a second vaginal portion (B) to the left side It was perfectly well formed, but slightly smaller

than the vaginal portion on the right side. The falciform fold of vaginal mucous membrane (F) passed between the two vaginal portions, running, as already mentioned, from before backwards and slightly from right to left. The tent was now removed from the right cervix. The uterine sound was passed into each cervix, and passed the same distance on each side—viz. 4½ inches. The right cervix (A) was now further dilated by means of Hegar's dilators till the finger could be passed through it into the uterus. The submucous fibroid (D), the size of a large walnut, was felt attached to the fundus and to the right side. It was seized with polypus forceps and twisted till it seemed loose, but it could not be brought away till the cervix was further dilated up to the size of No. 24 Hegar. The condition of the uterus was then examined more closely. The uterine sound was passed into the left cervix, and the finger into the cervix on the right side, through which the fibroid tumour had just been removed. The condition of things figured in the illustration was then found—that is, the finger felt the sound in the cavity (C) of the body of the uterus, showing that there was a single cavity for the body of the uterus, into which led the two separate cervical canals. There was a sort of spur (E) felt a little above the level of the internal os. Bimanually the upper part of the uterus was felt to be slightly irregular, there being three distinct prominences, as figured in the illustration, most probably due to the presence of sub-peritoneal fibroids. The patient made an uneventful recovery.

4. *Uterus bicornis.*—The external appearance here is not that of a normal uterus, as there is a sulcus at the fundus, dividing it into horns (Fig. 254).

The sulcus may be a very deep one so as to separate the body of the uterus into two parts as low as the internal os.

I performed a double ovariotomy on a patient who had this malformation; one of the ovarian tumours reached forward between the separated halves of the body of the uterus, and was firmly adherent to the bladder.

The cavity may be completely divided into two by a septum, or incompletely, there being two cavities above and a single cervix.

In rare cases the uterus may be rudimentary or absent. In such cases the ovaries are usually absent, but they may be present.

The following case was one of ill-developed uterus, with imperforate hymen, and probably imperforate vagina :—

Kate L., aged 20, single, a general servant, came to the London Hospital complaining of "general debility," and of having never "seen anything." On examination it was found that the hymen was imperforate, but not

bulged, as it is when there is retention of menstrual fluid above it. The orifice of the urethra was rather small, but she had had no trouble as to micturition.

She was a patient in whom bimanual examination was very easy and satisfactory. On examining her per rectum in this way, the only repre-

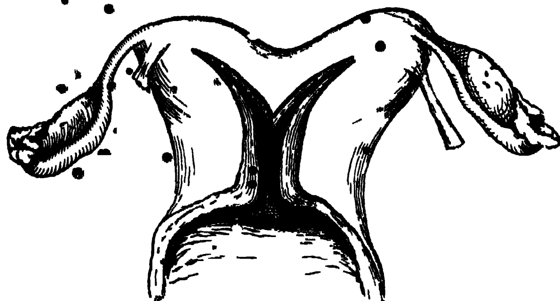


FIG. 254. UTERUS BICORNIS (Schroeder.)

sentative of any uterus to be felt was a small solid body about 1 inch long and perhaps a quarter of an inch thick. The whole pelvis was thoroughly searched bimanually, but nothing else was found.

Infantile uterus.—Here the uterus in the adult retains its infantile characters, that is to say, the cervix is relatively well developed as compared with the body, which forms only



FIG. 255.—INFANTILE UTERUS (Schroeder.)

a quarter, or thereabouts, of the whole length of the uterus. The whole uterus is small, one and a half to two inches long. In such cases the vagina and ovaries are also usually incompletely developed.

Congenital atrophy of the uterus.—Here the relative proportions of the body and cervix are normal, but the whole

uterus is small. Usually there is a very marked anteflexion of the uterus, and the vaginal portion of the cervix points forwards. In such cases, if menstruation occurs at all, it is irregular and painful, and the function is late in beginning. The menopause occurs early.

Malformations of the vagina.

The vagina may be absent.—The uterus and its appendages may in such cases be either rudimentary, or well developed; in the latter cases the non-development of the vagina causes retention of menses (Hæmatokolpos, Hæmatometra). (Consult pp. 95–99.)

I have seen some cases of this; in one, for instance, due to a complete septum about one inch and a half from the vaginal orifice. The external organs of generation were normal.

The following is an abstract of the case:—

S. K., aged 18, single, complained of pains in the abdomen that had lasted two years, and of pain in the left groin of two months' duration; she had had occasionally great difficulty in passing her water for two years.

Menstrual history.—She had never "seen anything," but she had every month a feeling of malaise, and the pains in the abdomen were worse at that time.

She had been in bed for a month before I saw her, and she felt ill in herself.

Appetite poor. Pains at the epigastrium after food. Bowels very loose, acting two or three times a day.

On abdominal examination an elastic swelling is felt occupying the hypogastrium; at its upper part a knob-like projection can be felt (uterus ?). The whole swelling is about the size of the uterus at the end of the fourth month of pregnancy. External genitals normal. The vagina is completely occluded by a transverse septum about 1½ inches from the orifice. Bimanually it can be recognised that there is a collection of fluid between the hand on the tumour in the hypogastrium and the finger in the vagina. I heard subsequently from her medical attendant that she had been operated on, and the usual treacly fluid evacuated, but that the patient died of septic peritonitis about a month after the operation.

I have also seen a case where there was a somewhat similar septum, apparently at first sight complete, but in which careful examination discovered a fine aperture just admitting an ordinary surgical probe.

The details of the case are as follows:—

Edith M., aged 20, married two years, no children or miscarriages, came to the London Hospital complaining of pain in the left iliac region, worse at the periods; she had had this for a long time, but the pain had been worse at the last three periods.

She had had a white vaginal discharge for two years.

Menstrual history.—Catamenia appeared at thirteen, regular every three weeks, scanty and pale, always attended with much pain, which, as mentioned above, had been worse the last three times.

On examination a septum was found across the vagina about 1½ inches from the orifice. The external organs were normal. Per rectum the uterus could be felt to be of the normal size, and freely movable.

I took her into the Hospital, and examined her under ether. A careful examination of the septum showed the presence of a minute aperture in it, just admitting an ordinary probe. The septum was then cut through with scissors, and the opening enlarged by dilating with the fingers. Nothing else abnormal was detected. The patient did well subsequently.

The following case was one of complete absence of the vagina, with double uterus and double hæmatometra. I believe the case to be unique in respect of the double hæmatometra.

L. T., a single girl, aged 17, was first seen by me on November 26, 1893, at Reading, at the request of Dr. Roberts, of Reading, who was attending her. On that occasion a very careful examination was made, the patient being under the influence of an anæsthetic. The condition of things discovered at that examination is described below.

Family history.—Her father is alive and well. Her mother died during the patient's infancy. She has no sisters or brothers, but she has half-sisters and half-brothers.

Personal history.—She is seventeen, and will be eighteen on May 24 next. She has lived all her life at Southampton, and has had no illness of any kind before the present trouble began.

Special history.—She has never "seen anything" at all, but for some time past (the time when the pain began was not given very accurately) she has complained of great pain in the hypogastric region and back, which comes on about once a month, and lasts about fourteen days. Severe pain is practically her only symptom.

At the examination on November 26, 1893, the following facts were noted:—The patient is a tall, well-developed girl; the breasts are well developed. On examining the abdomen no swelling could be felt in the hypogastric region, nor was there any swelling to be felt there at any time subsequently, though she was examined on many occasions extending over a period of more than two years, during which she was kept under observation before the operation.

Vulva.—When the labia are not separated the appearance of the

external genitals is quite normal, the mons Veneris, labia majora, and pubic hair present their normal appearance On separating the labia majora, the nymphæ, glans clitoridis, vestibule, urethral orifice, fourchette, and fossa navicularis are normal, but where the vaginal orifice should be, the condition is as follows —There is a slightly raised median ridge running from before back from the posterior margin of the urethral orifice to where the posterior margin of the vaginal orifice should be. On each side of the raphe described there is a slight depression of the surface, to the extent of $\frac{1}{12}$ of an inch or so and round each of these depressions there is a distinct, but rather rudimentary hymen That is to say, where the vaginal orifice should be there is a central antero-posterior ridge, with



FIG 256—CAST OF L T DOUBLE UTERUS, WITH DOUBLE HÆMATOMETRA AND COMPLETE ABSENCE OF THE VAGINA

The dark area immediately in front of the anus is the artificial vagina formed by the operation In it, high up, are seen the two openings, one into each half of the double uterus, made at the operation In front of the oval dark area (artificial vagina) is seen the condition of the external genitals before (and after) operation

a very shallow depression surrounded by a rudimentary hymen on each side of it (Fig 256)

On rectal examination a uterus can be felt bimanually, it is in the normal position, and fairly movable As regards its size, the uterus appears to be rather larger than the uterus of a virgin aged seventeen, but not very much larger Certainly it is not so much enlarged as to lead one to feel sure there is any accumulation of menstrual fluid inside it. With the sound in the bladder and the finger in the rectum, the partition between the rectum and the bladder is felt to be very thin, and especially so in the

neighbourhood of the cervix. A dimple is felt at the end of the cervix, which is taken to be the external os uteri, it points backwards and somewhat to the right The distance from the anus to the position of the os was measured as carefully as possible with the finger, and found to be about 2 inches. This is of interest in the light of what occurred at the operation, as the dissection had to be carried about 3½ inches or more from the surface before the dimple in question was reached As regards the opinion of the case arrived at on this occasion, I came to the conclusion that there was no vagina, but that, on the other hand, there was no evidence on physical examination of distention of the uterus As the patient only complained of pain, it did not seem at that time that making an artificial passage to the os uteri would necessarily relieve it, as the

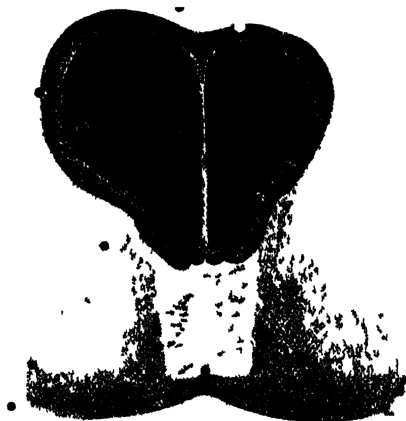


FIG 257 Diagrammatic representation of the uterus in case of L T before operation The uterus is seen in coronal section (i e a section parallel to the coronal suture)

pain did not seem to depend on distention of the uterus I therefore advised postponing the question of any operation till there was definite evidence of accumulation in the uterus The patient was given ichthyol in pills for some time and it seemed for a while to relieve her I should say that I took her into the London Hospital on January 12, 1894, and kept her in till March 2, 1894 During that time there was no rise of temperature, the only symptoms were the pain described and headache There were intervals when was she free from any discomfort

Examination during her stay in the Hospital confirmed the results already found when she was examined at Reading

I saw her at intervals during 1894 and 1895 Sometimes she was free from pain for long intervals, while at other times the pain was very severe She was readmitted into the London Hospital on October 31, 1895 The attacks of pain had been irregular in their occurrence, and not every month For instance, the last onset of pain was six weeks before her

readmission, and it continued up to her admission. The pain is often worse at night. The pain is said to be rather on the left side of the hypogastric region, and to extend down the left leg as far as the knee, as well as being felt in the lower part of the back.

November 14, 1895.—An anæsthetic was given, and she was again thoroughly examined. There was no swelling to be felt in the lower part of the abdomen even when she was deeply under the influence of the anæsthetic. On bimanual examination per rectum the uterus was felt to be distinctly enlarged, and about the size of the pregnant uterus at the eighth week. There was a swelling to the left of the uterus, which could not, however, be separated from the uterus, and it seemed like an enlargement of the uterus in that direction.

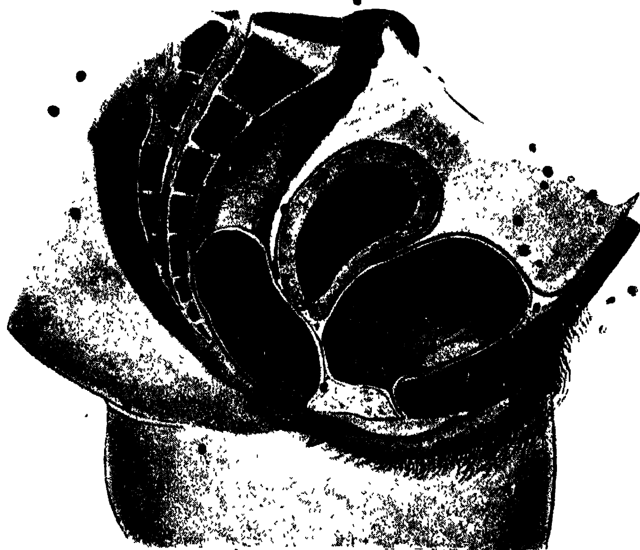


FIG. 258.—Diagram to show the relation of the uterus to the adjacent parts in mesial sagittal section in the case of L. T.

I felt sure now that the uterus was distended, and accordingly decided to operate. Extensive alterations were being made in the ward at the time, causing a great deal of noise, so that the operation was postponed till January 2, 1896. In the meantime the patient was often in great pain and hypodermic injections of morphia were frequently needed.

As to the nature of the proposed operation, the question as to whether a preliminary abdominal section should be undertaken, as has often been suggested, was carefully considered. It is well known that dilated Fallopian tubes not rarely complicate cases of hæmatometra. As I had carefully watched the case for two years, and seen the patient both when the uterus was little, if at all, distended, and again when the uterus was clearly enlarged, it seemed to me that most probably in this instance the

Fallopian tubes were not dilated. I therefore decided to attempt to make an artificial passage up to the uterus without any preliminary abdominal operation.

Operation, January 2, 1896.—The patient was anæsthetized with the A.C.E. mixture, and placed in the lithotomy position. The parts having been thoroughly sponged with corrosive sublimate lotion (1 in 1000), a transverse incision about 2½ inches long was made in the perineum just behind the fourchette. A sound was held in the bladder, and the left forefinger frequently introduced into the rectum during the operation. The wound was gradually deepened, partly by tearing, but principally with the knife and scissors. The sides of the wound were held apart by strong retractors right and left. The point aimed at was the dimple felt on examining per rectum. The dissection had to be carried further from the surface than had been anticipated; and the depth of the wound was at least 3½ inches. The strong traction on each side of the wound had gradually torn the perineum back to the very margin of the anus, and a few fibres of the sphincter ani were torn. The cavity produced by the dissection was of a capacity to allow of its containing the fist. It was at length possible to recognise that the immediate neighbourhood of the uterus had been reached, a part uncovered by bladder. There was no trace of any pre-existing cavity, an interesting point, because in cases of atresia of the vagina the atresia is often confined to the lower part of the vagina—the lower third or half, for instance. When the obstruction has been opened up to that extent, a normal vagina is found above. There was nothing of the kind in the present case, nor was there any trace of the normal smooth covering of the vaginal portion. The part of the uterus corresponding to the vaginal portion, as regards its aspect towards the vagina, merely presented the raw surface made by the dissection. As the dissection proceeded it had gradually come to my knowledge that there was something in the nature of a second dimple felt to the right of the one that had been recognised before the operation.

When the amount of tissue over the principal dimple, that to the left (of the patient), was felt to be very little, a pair of Wells' small pressure forceps was thrust into it, evidently at once entering a cavity; the usual dark treacly fluid met with in cases of retained menses at once began to escape. The opening was enlarged by separating the blades of the forceps till the finger could be passed into the cavity. This was felt to be slightly loculated at one place, and to extend some distance to the left side.

Towards the middle line this cavity presented a vertical partition, towards the left its wall was concave. The dimple to the right side was now localized as well as possible, and a pair of Wells' forceps similarly thrust into it. It entered a larger cavity than that on the left side, and the puncture was followed by a fresh escape of retained fluid. The opening was enlarged with the forceps, and the finger passed into this right cavity. This cavity seemed to have been about the size of a duck's egg. Each cavity was now washed out with hot iodine water, a strip of iodoform gauze was packed loosely into it, an inch or so being left hanging from each os uteri into the vagina. The wound (vagina) was now packed with

iodoform gauze. Two stitches were put in to unite the tissues for a quarter of an inch in front of the anus, and the patient was put back to bed.

Subsequent progress.—The patient went on very comfortably from January 2, the date of the operation, till January 13, having little or no pain, and no rise of temperature. The gauze was still in; a little of the lower end of the part used to plug the vagina had been cut away on two occasions.

On January 15 the temperature rose for the first time since the operation, reaching 101°. The gauze was removed from the vagina, and also two strips from two compartments of the uterus. A good deal of pus followed the removal of the vaginal plug, and some also the removal of each uterine plug.

On the 16th the temperature was still up (102°). As the patient was extremely tender, an anæsthetic was given in order to wash out the two uterine cavities thoroughly. This was done with iodine water. The finger was passed into each os uteri. Each uterine cavity was mopped out with pure tincture of iodine, the excess being washed away, and iodoform was introduced with a Récamier's curette freely into each cavity; a good deal of iodoform was also left in the vagina, but no plug of gauze was used on this occasion.

The rest of the patient's progress was uneventful. The cavity contracted rapidly, but was kept from becoming too small by passing No. 26 of Hegar's bougies daily. A pewter ring was modelled to fit the vagina, and the patient left the Hospital on February 22. Examination before she went out showed that the uterus had become very much smaller than it was found to be at any time before the operation. When examined with a Sims' speculum, the two apertures leading to the uterine cavities could be seen about half an inch apart at the top of the vagina. The vagina was about 2 inches deep from the surface. Some of its surface was still granulating, but over a good deal of the lowest part the epithelium had spread in. The patient had complete control over the bladder and rectum, She was seen again a week afterwards, and a small ring pessary, 1⅝ inch in diameter, was put in instead of the pewter pessary.

There has been a great deal of difficulty in keeping the artificial vagina open. When an ordinary small ring pessary is left, the parts cohere through the opening of the ring. I therefore had a small vulcanite ring made with a vulcanite diaphragm, perforated by a few small holes. This acts fairly well, but there is a tendency for the passage to close, and the ring is found embedded each time, more or less, in granulation tissue. Changing the pessary causes a great deal of pain. On this account I think in similar cases it would be better to do an abdominal hysterectomy in the first instance. The patient menstruates regularly and painlessly. I have seen her several times since the operation, the last time in October 1897.

The vagina may be double.—There is a septum dividing the vagina wholly, or partially into two separate parts. When there is a double vagina, and also a double uterus, on one

side there may be occlusion of the lower part of the vagina, the other opening as usual; on the occluded side there will be retention of menses. This is called "unilateral hæmatokolpos."

Atresia, or occlusion of the genital canal.—This may be congenital or acquired.

In congenital cases it may be due to either imperforate hymen, occlusion of the vagina, or, less commonly, occlusion at some part of the cervix.

Acquired occlusion is due to inflammation, followed by adhesion of the inflamed surfaces. Injuries to the vagina and cervix during labour, and sloughing of the vaginal walls after acute specific fevers, account for most of these cases.

Occlusion of the opening into the uterus may follow amputation of the cervix.

STERILITY.

The late Dr. Matthews Duncan showed that there is no reason for regarding a woman as probably sterile till three complete years of married life have passed without the occurrence of pregnancy.

Etiology.—The local causes to which sterility may be ascribed are :—

1. *Pelvic peritonitis which has obliterated the openings of the Fallopian tubes.*—When this has occurred on both sides, so that both Fallopian tubes are occluded, it is of course impossible for an ovum to reach the uterus, and the sterility is absolute. This is by far the commonest local cause of sterility.

2. *Ovarian tumours (if double).*

3. *Morbid conditions of the endometrium.*
   Corporeal endometritis.
   Fibroid and other polypi.

4. *Imperfect development of the uterus or ovaries.*

5. *All causes of pain on intercourse.*—Particularly if it is severe enough to give rise to vaginismus.

We must not forget that the fault may be with the husband,*

* M. Pajot, basing his notes on observations of 400 cases, concludes that, of 100 sterile marriages of from two to fourteen years' duration, the husband is at fault in from fifteen to twenty cases. (See *Sterility and Impotence*, Ultzmann, translated by Arthur Cooper.)

and it is a fact that the same woman may be sterile with one husband and fertile with another.

There is a very strong probability against any narrowing of the cervical canal, short of actual occlusion, being the cause of sterility in any particular case. This is shown by Pallen's statistics, quoted by Galabin, where in 337 cases of sterility the cervix was incised, only 13 or 14, however, becoming pregnant afterwards, which, as Dr. Galabin says, is not a greater proportion than might be accounted for by coincidence. Still, a cervical canal dilated, say up to the size of No. 12 in Hegar's series of dilators, must, one would think, allow a larger proportion of semen to enter the uterus than a canal that only admits the uterine sound. If nothing abnormal can be made out on careful examination, and the patient has been married three years, and is anxious to have her chance of having a family increased, dilatation of the cervix to the extent mentioned may be tried. I had a good example of the apparent success of the operation in a patient who had been married eighteen years without the occurrence of pregnancy. She became pregnant a few months after the cervix was dilated, and bore a healthy child at full term.

Treatment.—If the patient has not been married three years, we need only attend to the general health; till then there is no reason for her to think she will have no children. If, however, there is pain on coitus, we endeavour to discover the cause, and treat it in a suitable manner. If the pain on coitus leads to secondary vaginismus, we may expect to cure the vaginismus by removing the cause. In primary vaginismus, *i.e.* where we can discover no local cause, we may try the treatment recommended on page 136.

In face of the strong probability against narrowness of the cervical canal at any part being the cause of sterility in any given case, it is undesirable to resort to incision of the internal or external os. If the patient suffers from spasmodic dysmenorrhœa (which is common in cases of sterility), and there is nothing abnormal to be made out by physical examination, we may endeavour to cure the dysmenorrhœa by dilating the cervix, as recommended when discussing dysmenorrhœa.

APPENDIX A.

Note on the Systematic Treatment of Nerve Prostration and Hysteria.—The Weir-Mitchell Treatment.

THIS plan of treatment was originally introduced by Dr. Weir-Mitchell, of Philadelphia.

The cases for which it is suitable are those where careful examination discovers no organic disease of the nervous system, and where some one or more of the symptoms commonly known as hysterical are present. The patient is a "worn and wasted, often bedridden, woman, who has broken down either from some sudden shock, such as grief, or money losses, or excessive mental or bodily strain. At first, perhaps, there may have been only a debility, constantly, however, on the increase, daily more and more yielded to, until at last all power of effort is lost, fostered too often by injudicious sympathy, and the constant nursing of devoted relatives and friends. Coincident with this is the total loss of appetite, the profound anæmia, and the concurent wasting of the tissues, so characteristic of these cases. On the soil so prepared are often developed the graver protean forms of hysterical disease, such as paresis or paralysis, vomiting, disorder of motion, hystero-epilepsy, &c." *

The chief points in the treatment are:—

1. Removal of the patient from her surroundings to lodgings, or a hospital for private patients, where she can be isolated, no one being allowed to see her but her doctor and nurse.

2. The patient at first is to be kept absolutely at rest in bed.

3. The use of mechanical tonics to produce muscular waste. This is done partly by systematic kneading and

* *The Systematic Treatment of Nerve Prostration and Hysteria*, by W. S. Playfair, M.D.

rubbing of the muscles by a trained masseuse, and partly by making the muscles contract by applying the faradic current.

In this way the patient's power of assimilating food is greatly increased.

4. Systematic over-feeding.

It is essential that the patient should be removed from her surroundings; any attempt to carry out the treatment at the patient's own home is likely to end in failure.

Another point of importance is the selection of a suitable nurse. She must be capable of exerting a moral control over the patient; and yet, on the other hand, she must be kind, and able to make herself an agreeable companion. It may be necessary to change the nurse, if in a few days the case is not going on satisfactorily; and in this way success has been the result where failure appeared imminent.

For two or three days the patient is kept on a milk diet alone. Then massage is commenced, at first for about twenty minutes, afterwards for an hour and a half, night and morning. The faradic current is also used for from ten to twenty minutes, night and morning. By about the tenth day the patient is taking about two quarts of milk, and three full meals in addition, as in the following diet-sheet taken from the late Dr. Playfair's book:—

Breakfast, consisting of a plate of porridge and cream, fish or bacon, toast and tea, coffee or cocoa.

Lunch, at 1 p.m., of fish, cutlets, or joint, and a sweet, such as stewed fruit and cream, or a milk pudding.

Dinner, at 7 p.m., consisting of soup, fish, joint, and sweets; and, in addition, a cup of raw meat soup at 7 a.m. and 11 p.m.

The treatment lasts from a month to six weeks.

APPENDIX B

Coccygodynia.

THIS is an affection characterized by pain referred to the coccyx, or its immediate neighbourhood. The pain is felt especially when the bone is moved, or pressed upon, and therefore occurs in getting up, or sitting down, during defæcation, and coitus.

As regards causation, in some cases the cause appears to be constitutional, the condition occurring in rheumatic subjects without any history of local injury, and it may also similarly occur as one symptom in patients of a strongly neurotic temperament.

In other cases—and these constitute the majority—the affection follows some injury, such as the traumatism incidental to a difficult labour, or a fall, kick, or blow involving the coccygeal region. Thus the bone itself may be dislocated, or fractured as a result of such injuries, and its attachments may also be torn.

When the condition is due to constitutional causes the prognosis is not very satisfactory, but when due to local causes, it may generally be cured by appropriate treatment.

Treatment.—Anodyne applications may be tried, such as a liniment of menthol Counter-irritation by means of blisters applied over the sacro-coccygeal articulation is sometimes useful. If this line of treatment fails, the best thing is to remove the coccyx

For this operation, after the usual preparation prior to any operation, the patient lies on her left side with the hips well raised, an incision is made over the coccyx for its whole length, and the surface of the bone exposed. The tip of the coccyx is then seized with suitable forceps, and freed from its attachments with the knife. Similarly, all the lateral attachments are divided close to the bone. The latter is held forwards by the forceps attached to its tip as well as possible, and the anterior attachments are then divided close to the

bone with blunt-pointed scissors. The coccyx is then to be disarticulated from the sacrum with the knife, and removed. The resulting wound will be found to be much deeper than would be supposed. In suturing it, it is desirable to pass the sutures (silkworm-gut) completely buried. In order to do this, a well-curved needle is necessary, and it is an advantage to have the wound rendered less deep by an assistant pressing up the floor of it with his finger in the rectum. As advised by Ashton, I think it is well to leave a drain composed of a few strands of silkworm-gut along the floor of the wound, projecting half an inch at each end of it. This is removed in forty-eight hours, one end is pulled out a little and then cut off short, level with the skin, and then the whole drain is removed by pulling on the other end. It is important to keep the wound as dry and as clean as possible. Therefore, for the first four days the bladder should be regularly emptied with the catheter, and the bowels should be kept confined for the same time. The sutures are taken out at the end of a week, and the patient is kept in bed about a fortnight from the date of operation.

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